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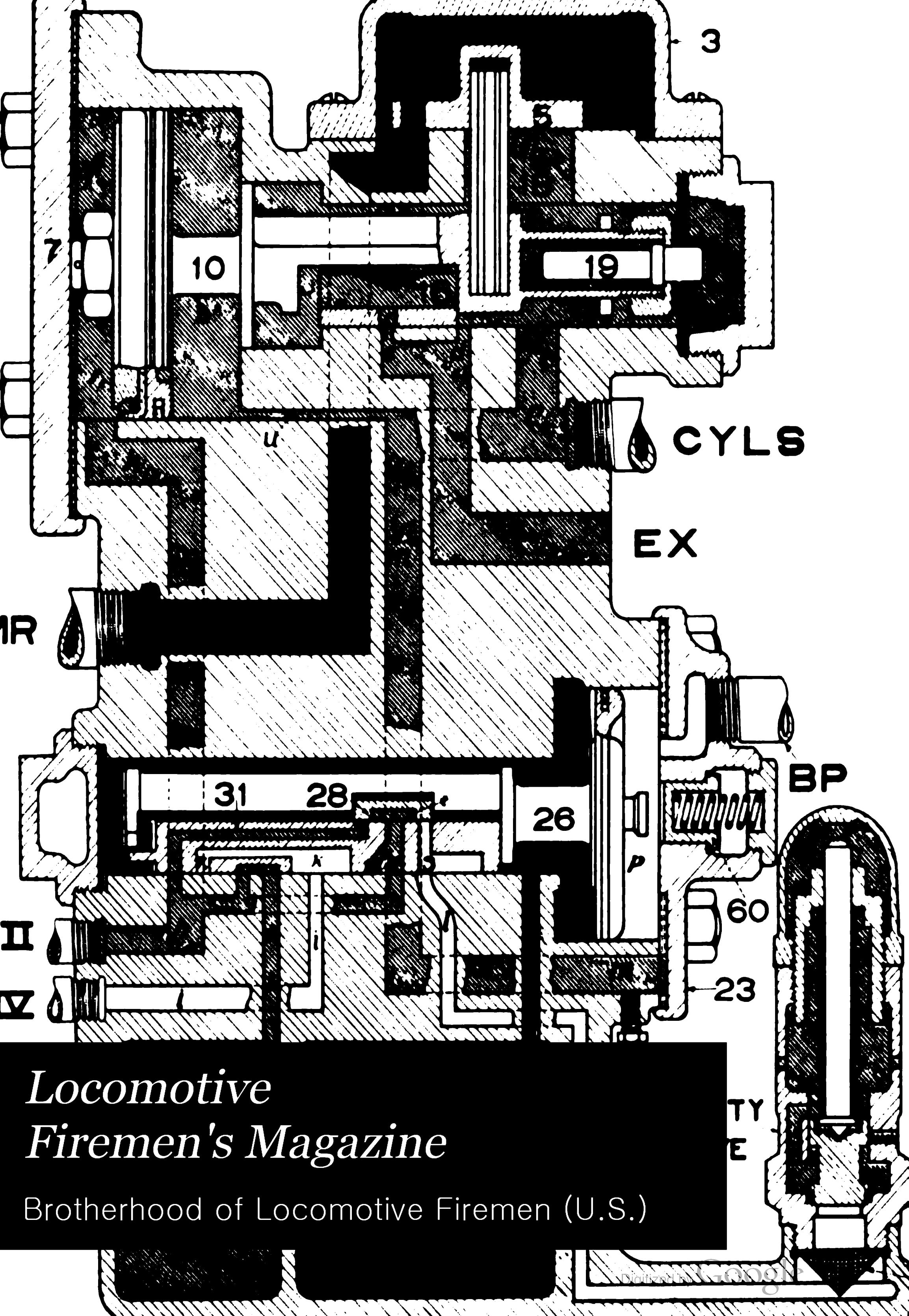

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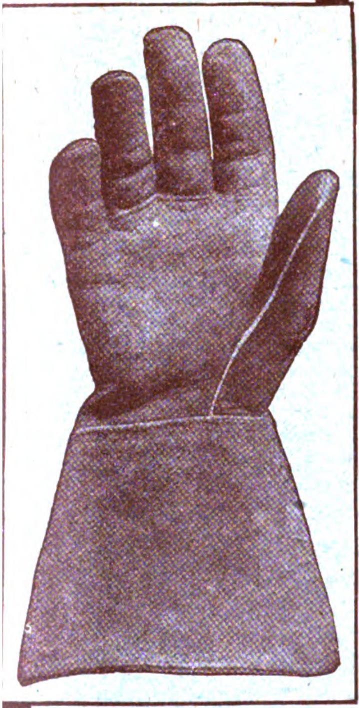

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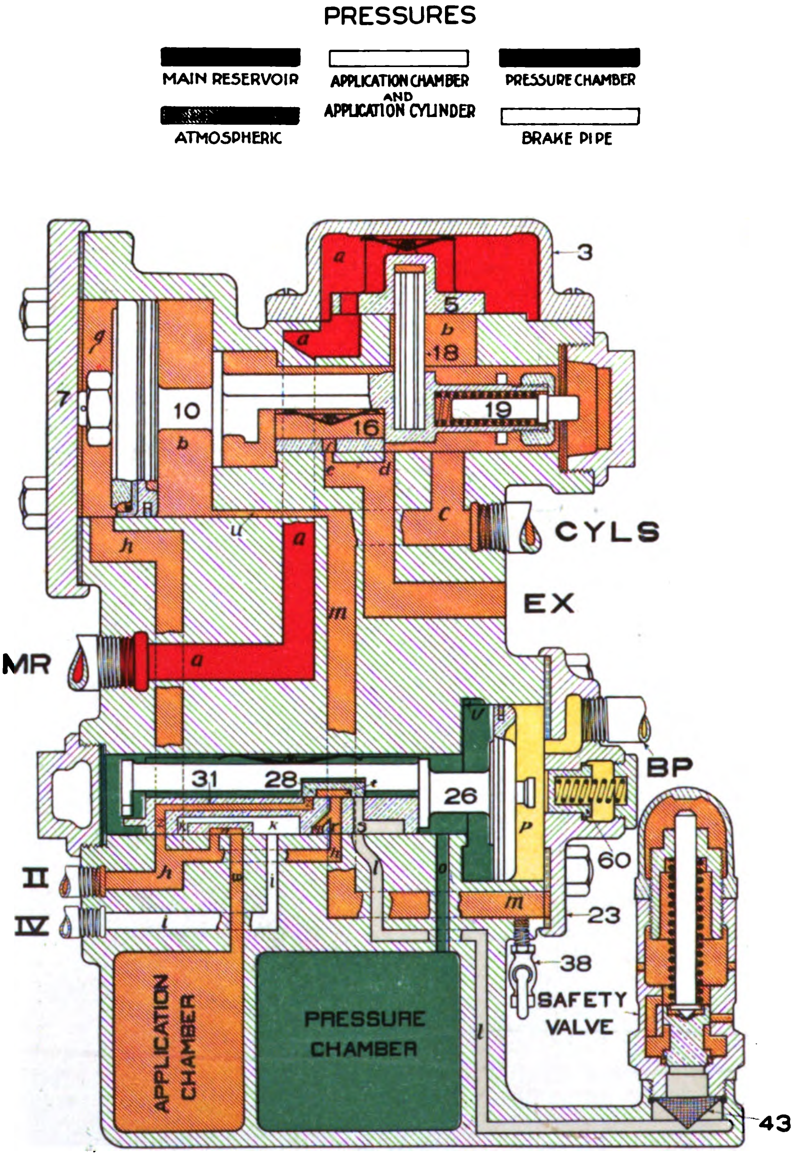

Locomotive Firemen and Enginemen's Magazine Educational Charts

WESTINGHOUSE AIR BRAKE SERIES

PLATE XL—DISTRIBUTING VALVE, No. 6 ET LOCOMOTIVE BRAKE EQUIPMENT

(Release Position—Independent Release After Automatic Application)

BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine,
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

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Plate XL—Distributing Valve, No. 6 ET Locomotive Brake Equipment (Release Position—Independent Release After Automatic Application).

Plate XL of the Westinghouse Air Brake Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts represents the No. 6 ET distributing valve with the operating parts in the positions they assume when the locomotive brake is released by the independent brake valve after an automatic application, and is a possible sequence to Plate XXXIX, *service lap.* Of the two portions of the distributing valve, the application portion assumes the same position in which it was shown in the chart of *automatic and independent release,* while the lower, or equalizing portion remains as it was presented in last month's chart, at *service lap position;* in other words, when the locomotive brake is released by means of the independent brake valve no part of the distributing valve is affected except the "application" mechanism. It is a question, by the way, if *application portion* in reference to the upper parts of the distributing valve is not somewhat of a misnomer and misleading, as, although it does supply the pressure to the brake cylinders, it also performs the opposite duty of releasing the pressure from them.

Placing the independent brake valve in release position is effective in releasing the locomotive brake under all circumstances, regardless of what may have caused the application or of the position of the automatic brake valve, as the application cylinder pressure will be discharged to the atmosphere at the independent brake valve directly; in double-heading, for instance, the automatic brake valve of the second engine will be cut out from the brake pipe, with the handle in running position, with the No. 6 equipment, and if an automatic application should be made by the leading engineer the brake of the following engine will apply and hold with regular force, but may be thrown partly or wholly off by using the release position of the independent brake valve.

Under any circumstances of application with the independent brake-valve handle in release position the following action takes place: As the application cylinder pressure escapes, brake cylinder pressure in chamber *b* moves application piston *10* to the left, causing exhaust valve *16* to open exhaust ports *c* and *d* as shown in Plate XXXV, thereby allowing brake cylinder pressure to discharge to the atmosphere; the position of the *application portion* in the accompanying chart being a repetition, the color scheme should by this have made the phase of independent release pretty well understood.

Independent Part- or Graduated-Release.—With the automatic brake applied and the equalizing portion of the distributing valve in the lap position, as shown in this month's chart, it may be desired to only partly release the locomotive brake, as a precaution against wheels sliding, etc.; in that case, if the independent brake valve be returned from the release position to that of lap before all of the application cylinder pressure has escaped, application piston *10* will return to *independent lap* position (approximately as represented by the upper portion of Plate XXXVII of the series), as soon as the brake cylinder pressure is reduced a trifle below that remaining in the application cylinder, thus closing ports *e* and *d* and holding the remaining pressure in the brake cylinders; in this way the independent release may be graduated as desired.

The operation of *independent release* is simple enough, but it will be noticed by the engineman in graduating off the locomotive brake by the independent valve that sometimes a comparatively heavy volume of application cylinder air must be drawn off to secure a moderate reduction of brake cylinder pressure as noted by the red pointer of the small duplex gauge, while at other times a very slight discharge of air from the application cylinder will result in almost, if not quite, a complete release of brake cylinder pressure; and considering the damage that may be done to a long freight train at times by sudden and complete release of the locomotive brake, it is of importance to understand the different phases of the distributing valve as they may affect the independent release. The variations in results obtained from a certain number of seconds time of application-cylinder discharge are due to the different chambers of the distributing valve that may or may not be in connection with the application cylinder at the time the independent release is made. In the position taken by the equalizing piston and valve as shown in this month's chart, the reduction would be from the combined volumes of application chamber and application cylinder; if, in double-heading, while the leading engineer was applying the train and locomotive brakes, the second engineer—afraid for his driving wheel tires—should attempt to release with his independent brake valve, he would also be drawing against the same volume as before but with a slower and weaker sounding discharge, as the application cylinder pressure would be supplied gradually from the pressure chamber by the equalizing portion of the distributing valve in service application position; if, on the other hand, the engineer should make a brake pipe reduction of twenty-five pounds or more, in order to secure the full service power of all car brakes with respect to piston travel, the equalizing piston of the distributing valve of his engine would travel to the full limit of its stroke, giving a combination of pressure chamber and application cylinder air to which would be added the volume of the application chamber, while an independent release was being effected; and after an emergency application caused by train parting or *any* quite full-on application from any cause other than emergency application by the automatic brake valve of the subject engine, the volume of application cylinder air will be the same as in the previous case; but if the automatic brake valve should be placed in emergency position, a *maintaining pressure* will be supplied by it to the application cylinder of the distributing valve, through the maintaining port of the rotary valve (a phase of action to be explained more fully in connection with the H6 Automatic Brake Valve chart), and a branch of the application cylinder pipe (see Plate XXXIV, Piping Diagram); under the last mentioned circumstances the handle of the independent brake valve must be *held* in release position to prevent the locomotive brakes from reapplying so long as the handle of the automatic brake valve remains in emergency position.

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The Lackawanna Plans New Cut-Off.

From the New York World we learn that the Lackawanna Railroad Company has completed plans for the building of a cut-off which is intended to reduce the distance between Lake Hopatcong and Delaware Water Gap by a little over eleven miles, as well as the abandonment of a number of tunnels and grade crossings. Upon completion of the cut-off it is expected to operate trains to and from Buffalo over same. The World says:

The "cut-off" will extend from the main line at a point about two thousand feet west of Lake Hopatcong station westerly to the present main line at a point three miles east of Delaware Water Gap station.

Traveling over the present road one covers 39.57 miles, but by the proposed "cut-off" the distance will be reduced to 28.45 miles, twenty-three miles of which will be over straight track, eliminating a curvature equivalent to four and one-third circles, which, it has been computed, are encountered in journeying by way of the road now used.

The new line will be almost wholly within the State of New Jersey, passing through Morris, Sussex and Warren counties, crossing the Delaware river at a point one mile west of Portland, over which a bridge 1,350 feet long is to be constructed. The road will then cross Northampton county, Pennsylvania, to Slateford, where the proposed and present lines will join.

In addition to the span over the Delaware, there is to be one over the Morris canal at Port Morris forty-five feet in length, an arch viaduct at Hainesburg across the Paulin's Kill 1,000 feet long, and an arch which will span the Pequest river one mile west of Huntsville. All of the bridges will be of concrete, the amount of that material to be consumed aggregating 225,000 yards.

An embankment from Andover to Huntsville across the Pequest valley, a distance of two and one-half miles, will be constructed of 6,625,000 cubic yards of earth and stone. Its height will vary from seventy-five to one hundred and ten feet. This will be the largest embankment in America if not in the world, the one on the Union Pacific—Lane's "cut-off" in Nebraska—being the present holder of that title.

Tunnels at Oxford and Mauch Chunk, together measuring one and one-half miles, will be avoided by the "cut-off," and what might have been a tunnel, had the Lackawanna planned on old lines, will be eliminated at a point near Andover, where solid Jersey granite half a mile long and 130 feet deep will be excavated.

One feature of this improvement which will commend itself to the hearts and pocketbooks of dairy proprietors along the proposed route is that it will afford a market for their products, which heretofore they have been unable to ship to this and other cities owing to the labor and expense incidental to transportation to points on the present line. A rich iron deposit at Roseville, N. J., which has been practically abandoned for this reason, will spring into activity when the contemplated "cut-off" has been completed.

A treat is in store for the lover of nature. On both sides of the new road the scenery is particularly fascinating, and equals, if it does not surpass, that in the section through which the present line runs.

The bridge that carries the tracks will be different from any along the Delaware, or, in fact, any other river in this part of the country. It will be a concrete structure 1,350 feet in length, 80 feet above low water. The series of long arches, capped by smaller ones, observed in the Paulin's Kill viaduct, will be used here. There will be five arches spanning 150 feet, two spanning 120 feet, two spanning 30 feet, and eight of the small ones, graduated in size, on top of these. One mile up the banks of the Delaware, on the Pennsylvania side, the road will parallel the river, and just north of the town of Slateford the new tracks will join those of the present road, completing the route from Hopatcong to Water Gap.

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Enters New Field.

Mr. Edward Elden, formerly master mechanic of the N. Y. C. & H. R. R. R. and the L. S. & M. S. Ry., at Buffalo, N. Y., has associated himself with the Dodge Manufacturing Company, Mishawaka, Ind., as chief of sales of its railroad department. The many friends of Mr. Elden in both railroad and supply business will be pleased to learn of his new venture and will wish him abundant success.

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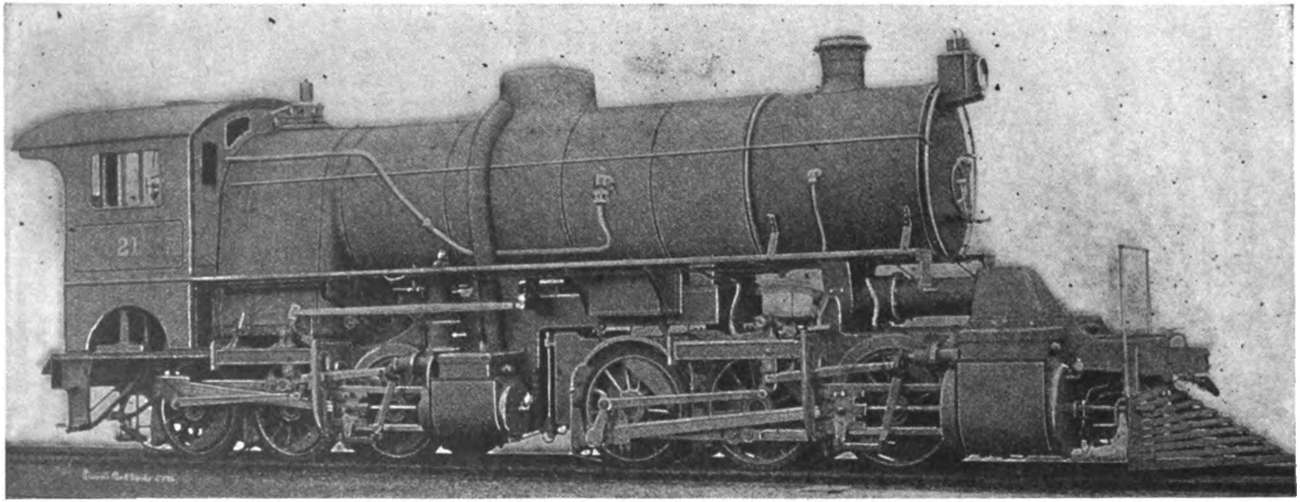
Twelve-Wheel Mallet Compound Locomotive—Imperial Peking-Kalgan Railway.

The North British Locomotive Company, Limited, of Glasgow, has recently completed one of three Mallet articulated compound locomotives for the Imperial Peking-Kalgan Railway, of North China, illustrations of which are shown herewith. These engines were designed to handle heavy trains on curves of 500 feet radius, and up gradients of considerable length, of 1 in 30, with an axle load of about 16 tons and total weight for adhesion of 96 tons.

The wheels of the back or main carrying frames are driven by two high-pressure cylinders, while the front set of wheels are operated by two low-pressure cylinders. By rigidly attaching the boiler to the main frames at the high-pressure cylinders the necessity for any flexible high-pressure pipe joints is obviated. A prolongation of the main frame, which further supports the boiler, transfers part of the weight to the front truck and relieves the boiler from all stress. A sliding bolster fitted with vertical buffer springs carries the weight of the boiler at the leading end. Suitable provision is



MALLET COMPOUND LOCOMOTIVE, IMPERIAL PEKING-KALGAN RAILWAY OF NORTH CHINA also made at both front and back ends for the support as well as for the free expansion of the boiler. The front truck is connected to the main frame by a hinged joint formed by the cast steel frame cross-stays. The receiver pipe between the high and low-pressure cylinders is provided with a ball and socket joint at the hinged end and a telescopic joint at the front end to provide for the movements of the front truck relative to the main frame. Ball and socket and telescopic connections are also provided between the low-pressure cylinders and the exhaust pipe. The lateral movement of the truck frame is controlled by a horizontal side check spring arrangement which is attached to the underside of the smokebox and so arranged as to form an emergency bolster for meeting abnormal stresses due to unevenness of the track or derailment.

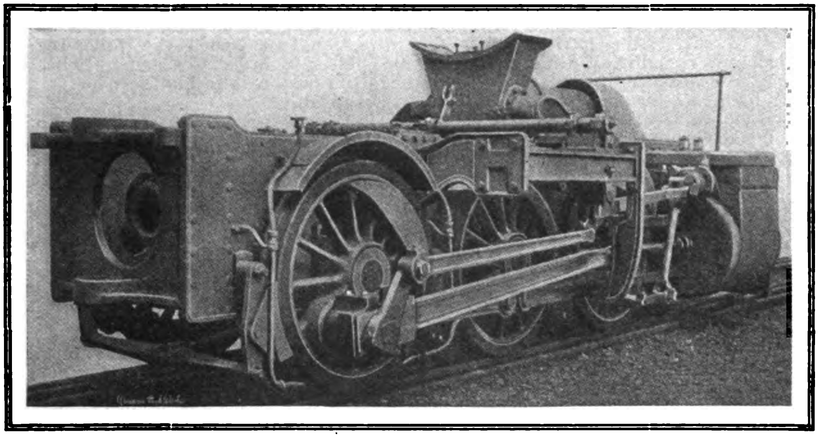
The high-pressure cylinders are provided with Richardson balanced slide valves and anti-vacuum valves, and the low-pressure cylinders are fitted with Richardson balanced slide valves, anti-vacuum valves, and water relief valves on each end at the bottom. Steam-actuated draining valves are provided for both high and low-pressure cylinders. No intercepting or change valves are used for starting purposes. A small auxiliary steam valve is placed in the cab and is operated by the engineer, which allows steam to be passed direct into the receiver.

The Walschaert type of valve gear is used for both high and low-pressure cylinders, the various parts being interchangeable throughout. The varying of the relative cut-off periods in the high and low-pressure cylinders is attained by suitable adjustments which are provided on the high-pressure reversing shaft lever. The reversing is effected by means of a steam gear which is controlled by a valve in the cab.

Westinghouse automatic and Westinghouse non-automatic or straight air brakes are a part of the equipment with which the engine is provided.

The cylinders are lubricated by means of oil pumps and Furness lubricators, and the boiler is fed by two injectors. The grate is of the finger-bar type, operated by steam gear. "Pop" safety valves and pneumatic sanders are provided. It will be noticed that the running boards are of the American type, which is said to be in accordance with the North British Locomotive Company's practice for the standard engines of the North China railways.

The principal dimensions are as follows: Gauge, 4 feet 8½ inches; high-pressure cylinders, 18x28 inches; low-pressure cylinders, 28¾x28 inches; diameter of driving wheels, 4 feet 3 inches; rigid wheel base, 9 feet 8 inches; total wheel base, 29 feet 4 inches; height of boiler center, 10 feet; total heating surface, 2,591 square feet; grate area, 45.1 square feet; working pressure, 200 pounds per square inch; weight in working order, 96 tons.



MALLET COMPOUND LOCOMOTIVE, IMPERIAL PEKING-KALGAN RAILWAY OF NORTH CHINA—FRONT TRUCK

Economical Methods of Firing Locomotives and Preventing the Emission of Black Smoke.

The committee appointed to investigate and prepare a paper on the subject: "What is Good Practice for Traveling Engineers Relative to Coaching and Demonstrating to Firemen Economical Methods of Firing Locomotives and Preventing the Emission of Black Smoke, and the Best Method of Interesting All Concerned in Coal Economy?" reported to the Sixteenth Annual Convention of The Traveling Engineers' Association, held at Detroit, Mich., August 25, 1908, as follows:

Referring to the latter part of the above subject, we recognize the fact that fuel economy and absence of black smoke go hand in hand, as black smoke is but another form of waste of coal, being simply unconsumed carbon; therefore, anything that will tend toward the saving of the first will likewise act as a preventive of the second, consequently in teaching firemen how to be saving in fuel we at the same time effect a marked reduction in the smoke nuisance.

We also feel that all members of this association fully realize the value of fuel, and the possibilities of an enormous saving to railways that can yet be effected by well-directed effort.

Chemistry should be of benefit to young men entering the mechanical field from the fact that chemistry is simply the science of changes that matter undergoes, and these changes are produced by energy changes; and every person in a mechanical field must deal with some form of energy change and either directly or remotely with some chemical change. The mechanic should understand the chemical laws underlying the changes with which he must deal. To take a concrete case: The machinery which is handled is in the majority of cases driven by power generated through steam. It is not enough to know simply the construction of the machines, but one should also know the reactions that change his coal into carbon monoxide and carbon dioxide, and the heat changes that accompany this transformation. He should understand the power he obtains directly proportional to the heating effects of his coal, and that this differs according to the condition of combustion with the same coal. In this way he is indirectly interested in the chemical reaction involved.

But more directly does he deal with chemistry with the very tools or material that he uses. The strength, elasticity and various properties of materials vary with the chemical composition of the material.

It becomes eminently important that the composition of materials be understood and what are the effects of various impurities.

Furthermore, it is important to know the chemical reactions that occur in the deterioration of material so as to intelligently prevent it, such as the rusting of iron.

There are many other ways in which the knowledge of chemistry is useful to the mechanic, such as the intelligent use of lubricants, the judicious treatment of water for steam boilers, the prevention of boiler scale, etc. In fact, wherever matter is dealt with there you have to do with a chemical individual or a number of chemical individuals; and it is of great importance to know the characteristics of these individuals in order to handle them with the greatest efficiency.

Knowing that all members are vitally interested and bending their energies in this direction, we issued the following circular letter in order to learn by what methods the best results had been or are being obtained.

1. Does your experience lead you to believe that firemen study carefully and use to advantage books and pamphlets provided them, treating of the principles of combustion and firing or of best results in giving instruction obtained by actual demonstration made by capable and intelligent firemen?
2. Do you advocate the employment of a traveling fireman or an assistant road foreman of engines, whose duties shall be the instruction of firemen? If so, give your reasons.
3. Please state if you require firemen before starting on a run to see that all openings to ash pans are unobstructed, in order to permit free access of air beneath the fire.
4. What are your instructions to firemen in regard to putting in coal when engine is starting train? Are your instructions that doors shall be kept closed when the engine is working hard to force the train into speed?
5. When should grates be shaken? Is it your practice to insist on grates being shaken when the engine is drifting or working steam very light, with light draft on fire?
6. Is it the practice on your road to compare the heating value of the coal used on the various divisions before comparing or criticising the performance of engine crews on a certain class of engine in different districts?
7. Do you instruct firemen in the functions of the various front end appliances and demonstrate their form and arrangement by actual tests?
8. Do you approve of inducing economy in fuel consumption by offering a premium on fuel saved, and if so, how is it determined, per ton mile or per engine mile?
9. From what source do you obtain firemen, and what early training do you give firemen before placing them on an engine?
10. Do you approve of student trips,

and if so, how many? Are your firemen given progressive examinations?

Although our circular was gotten out rather late, we must state, in justice to the members, that their replies were very prompt and very gratifying, and we take this opportunity of returning thanks.

A synopsis of the replies received, boiled down, results in the following conclusions: That fuel economy can only be effected through education; but that this education must not be confined to simply teaching the firemen how to fire or the engineer how to work his engine economically, but must extend from the bottom to the top; that is, from the man at the mines to the highest officer of the road, so that all will know and realize the importance of the subject, and by their help and co-operation assist us to bring about the desired results.

The efforts of the traveling engineer seldom extend down as far as the men at the mines, and not often as high or higher than the office of the superintendent of motive power, but are confined principally to the men in the cab, and while very effective so far as they go, do not by any means accomplish all that could be, were he granted full, absolute and extensive support.

While granting that the traveling engineer is given a certain amount of support from the upper quarters, yet candor compels us to say that this support, except in a few notable instances, is of but an intermittent and perfunctory nature, and therefore as a whole not lasting and of little actual value. This, however, is not through any spirit of laxity or indifference on the part of the higher officials, but is brought about by conditions and the fact that the average official on the American railroads is saddled with so many duties or has such an extensive territory that it becomes a hard matter to give each specific duty the attention that it deserves.

With the mechanical man fuel economy is subordinated to maintenance of equipment, and with the transportation man it is ranked by moving traffic, and, consequently, between the two the traveling engineer often fails to accomplish his ends simply for lack of proper support.

Fuel economy and the results that can be obtained are of sufficient moment to warrant any railroad in putting on a special man to look after this one feature alone.

Referring now to the replies received to the questions in their proper order:

1. Do firemen study? The replies would indicate that firemen as a rule do not study to advantage. The free literature distributed by the various railroad companies on the subject of fuel economy is appreciated, but the men are more inclined to absorb the information through oral instructions and practical demonstrations.

This, however, must not be taken as an argument against written or printed instructions. It simply proves the necessity of education along that line. The average fireman does not at first realize that he is simply an apprentice engineer, and that when he reaches that position more will be required of him than simply 200 pounds of steam, and therefore does not care to puzzle his cranium with the problems of combustion, but takes his knowledge in the easiest form and less troublesome doses.

It has been noticed, however, that where firemen have through study mastered the principles of combustion they usually stand at the head of the list of firemen, and likewise after promotion to engineers they have learned the art of mixing brains with CO^2 in the process of combustion, and so can do their work easier and better than their less educated brothers. The habit of applying brains to their work formed when firing remains to their after advantage as engineers. As the future fireman will use his head as much as his back, we urge that all study be encouraged, and to aid him to master what to many is a difficult lesson that teachers or instructors or demonstrators (whatever you may call them) be employed to help the willing firemen over the rough places. The unwilling man has no place on an engine.

2. Assistant road foremen. This question is closely related to the first question, and is the natural sequence of the argument.

We most emphatically advocate the employment of competent instructors, but would not call them traveling firemen, but assistant traveling engineers or assistant road foremen. He should have authority over the engineer as well as over the fireman, as without this authority, unless possessed of infinite tact, he might do more harm than good.

The assistant traveling engineer should be recruited from the ranks of engineers and should be a young, active and energetic man, one who can take the scoop when necessary and demonstrate to the fireman the correct way to handle it and get results—namely, the maximum amount of steam from the minimum amount of coal.

In addition, however, to being young and active and a first-class fireman, he should also be a first-class engineer, one who can, if necessary, demonstrate to the man on the right side of the engine how he can handle the engine to better advantage, and, by so doing, help himself, the fireman and the company.

Such a man must needs have brains, but on every railroad there are many of this class, as we all know. This man would naturally fall in line for the position of traveling engineer when the latter is promoted.

He should be subordinate to the traveling engineer and should either work directly under or else in harmony with him.

3. Inspection of ash pans, etc. Most roads require this, and all intelligent firemen naturally do it. A few trips

with the air openings stopped up soon convinces the fireman of the advantage of keeping them open, and the lesson once learned is not soon forgotten.

4. Instruction to fireman to keep the door closed, etc. This is another lesson that is soon taught by a little experience, but it is always advisable to teach it direct instead of letting the fireman find it out for himself, as the opening of the door and leaving it wide open while the engine is forced to the limit in lifting the train to speed is apt to cause other damage—leaky flues, etc. This practice should be discouraged, therefore, as it not only makes extra work for the fireman, but wastes coal and injures the boiler.

5. When should grates be shaken? This depends largely on local conditions, the nature of the coal, etc.; all are agreed, however, on the manner in which the grates should be shaken, namely, by short, quick jerks, and not a slow, rocking motion.

All are also practically unanimous that as a rule it is much better to shake the grates when the engine is drifting or working light than when being worked hard.

6. Comparison of heating value of coal. This is a refinement in comparison, men and engine efficiency that is practiced by but few roads. We recognize the fact that it is not always practical on all roads, and, except for a basis of comparison, is unnecessary. We believe, however, that comparison should not be made between two different divisions unless all conditions are exactly similar, not forgetting density of traffic.

The comparison should only be made between similar engines in the same class of service on the same divisions, but even that comparison cannot simply be made between passenger and freight, work and yard engines, on a ten-mile basis, with fairness, where regular engines are assigned to and kept, through and local passenger service, fast, slow and local freight, etc., as in that case, to be absolutely fair, comparison should be on a ten-mile-per-hour basis. Time is the one important consideration that is often lost sight of in making any comparison.

7. Instruction of firemen on front end appliances, etc. Too much information on any part of the locomotive cannot be imparted to the fireman or, for that matter, to any one else whose duties throw him in contact with engine service. Where it may not be practical to move a draft sheet up or down in order to give the fireman ocular demonstrations of its effect on the burning of the fire, yet the information to the effect and also the object of the different front end arrangements should be carefully explained, as the fireman knowing this can at once tell by the action of the draft on the fire if anything has become loosened or misplaced in the front end, in which case repairs can often be made before failure results.

8. Premiums. It is the sense of this association that monetary premiums do not have the desired effects; in fact, quite the contrary seems to be the case, as it has been found to lead more toward sharp practice on the part of the men than actual economy, and consequently the company is little, if any, the gainer.

It is our opinion that it is more preferable to encourage a spirit of friendly rivalry among the men and to hold out advancement and promotion as a premium instead of a small financial remuneration. We further believe that comparison between the efficiency of engines and men should be made on a ton-mile basis between those in absolutely similar service, and a monthly bulletin posted, showing the standing of different men. This bulletin can show the standing in dollars and cents, showing how much more one man cost the company to perform a certain amount of work than another. In addition to this bulletin, however, we favor giving letters of commendation to those at the head of the list, and friendly letters of admonition to those at the foot. If it is finally found that letters of admonition have no effect on the latter it is well to drop them from the service, as it has been found that any man who cannot be reached through his pride cannot be reached in any other manner, consequently he is unfit for railroad service.

9. Where firemen are obtained. As one of our past presidents so aptly expressed it, "You would not hesitate to pick a $20 gold piece out of the mud," so it makes little difference where you get your firemen, provided they are the right material. This is governed largely by local conditions and environment. My experience has been that the best men are recruited from the rural districts. As for early training, the common practice seems to be to let the applicant make student trips on freight engines, usually without pay, with experienced firemen and continue to make these trips until competent to go alone. This is usually a good tryout, as any man who will follow a modern engine for twenty or thirty days for nothing in order to learn to fire evidently wants the job and will no doubt stick.

10. Student trips. For examination, as mentioned above, student trips appear necessary, and there should be as many as required to win the approval of the traveling engineer or, in his absence, of three competent engineers with whom the applicant has made student trips.

Progressive examinations are heartily endorsed, as they appear to be the only way in which the majority can be induced to study and perfect themselves, but also a very moral way of getting rid of undesirable men when conditions justify. In conclusion, we find the entire matter resolves into a campaign of education, and therefore every one should be encouraged to acquire knowledge.

We must not forget, however, that as a fireman becomes better educated he becomes more observant, and consequently we cannot with very good grace keep hammering him to save coal, etc., while at the same time we let him see that for each scoopful he saves on the road a ton is wasted about the roundhouse and coaling stations. He will be apt to say, "Why don't you practice what you preach?" showing that there are others who need education on fuel economy besides the fireman.

Above all, however, when you find an engine crew or, in fact, any one trying hard to make a showing or a saving don't forget to encourage them.

The committee consisted of J. S. Downing, chairman; S. J. O'Gar, Frank Burke, G. C. Grantier and M. H. Haig.

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Steel Ties on Roads With Heavy Traffic.

Apropos of the question of conserving the natural resources of the country, among which our timber supplies are those that are being the most rapidly depleted, the question of the use of steel in place of wooden ties becomes of increasing importance. Generally speaking, experiments made by various railroads with steel ties have not given the encouraging results that were looked for; but the failures have not been of such a character as to prove that the steel tie is inherently and essentially unfit for railway service. Rather, we are inclined to think the failures have been due to details of form and fastenings. This is borne out by the fact that an important mineral road, the Bessemer & Lake Erie Railroad, which carries the heaviest mineral traffic of any system in the world, has adopted the steel tie as standard, using what is known as the Carnegie I-beam type. The road runs from Conneaut, Lake Erie, to Bessemer, Pa., a distance of 154 miles; it is full of undulating grades and a large amount of curvature, in which curves of four to six degrees are frequent, with a few of even sharper curvature. Last year the road carried twelve and a half million net tons of freight, and adding the passenger trains, the gross tonnage was over twenty millions. The locomotives weigh 125 tons, and over 90 per cent of the freight cars carry from 55 to 60 tons of freight apiece; conditions which, as every railroad engineer will recognize, are very trying upon the track and roadbed.

The experiments with steel ties began in 1900, when the company laid half a mile of track with inverted trough-shaped steel ties. When these failed to give satisfaction, except so far as they proved in their eight years of service that corrosion of the metal was quite insignificant, four and a half miles of track was laid with a heavy I-beam tie. The results were so encouraging that an improved tie of this section has been adopted as standard on the whole road. The track construction consists of 100-pound rails, 33 feet in length, with twenty steel ties to the rail. The ties are 5½ inches deep, 8½ feet long, with a top face 4½ inches and a bottom face 8 inches wide. The rail is held to the tie by means of a clip on either side bolted to the top flange. We understand that the company's engineers regard that portion of the tracks which is laid with steel ties as being superior, on every point of comparison, to that which is laid with wooden ties. The fastenings hold the rails absolutely to gauge, even on very sharp curves; and they are more effective in preventing creeping of the rails—a pheuomenon which, under certain conditions, has caused a large amount of trouble and expense. Moreover, the behavior of the ties under derailments is admirable, for they show merely a slight bending of the flanges, under conditions in which the wood ties have been completely wrecked. Finally, it has been proved by carefully kept records of the road, that the expense of maintaining the steel-tie track in level and alinement is 25 per cent. less than it is on wooden-tie track.—Scientific American.

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*A Novel Locomotive Coaling Crane.**

The modern coaling cranes of the locomotive type are most efficient machines and are now considered among the highest types of labor-saving devices.

The accompanying illustration, Fig. 1, shows the construction of a new eight-wheel locomotive coaling crane recently placed in operation on the St. Louis & San Francisco Railroad, while Fig. 2 shows the construction of the bucket in an open position ready to take up its load of coal.

This coaling locomotive used on the 'Frisco line is equipped, as will be seen, with a new form of boom, a special arrangement being provided in the boom

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*By Frank C. Perkins.

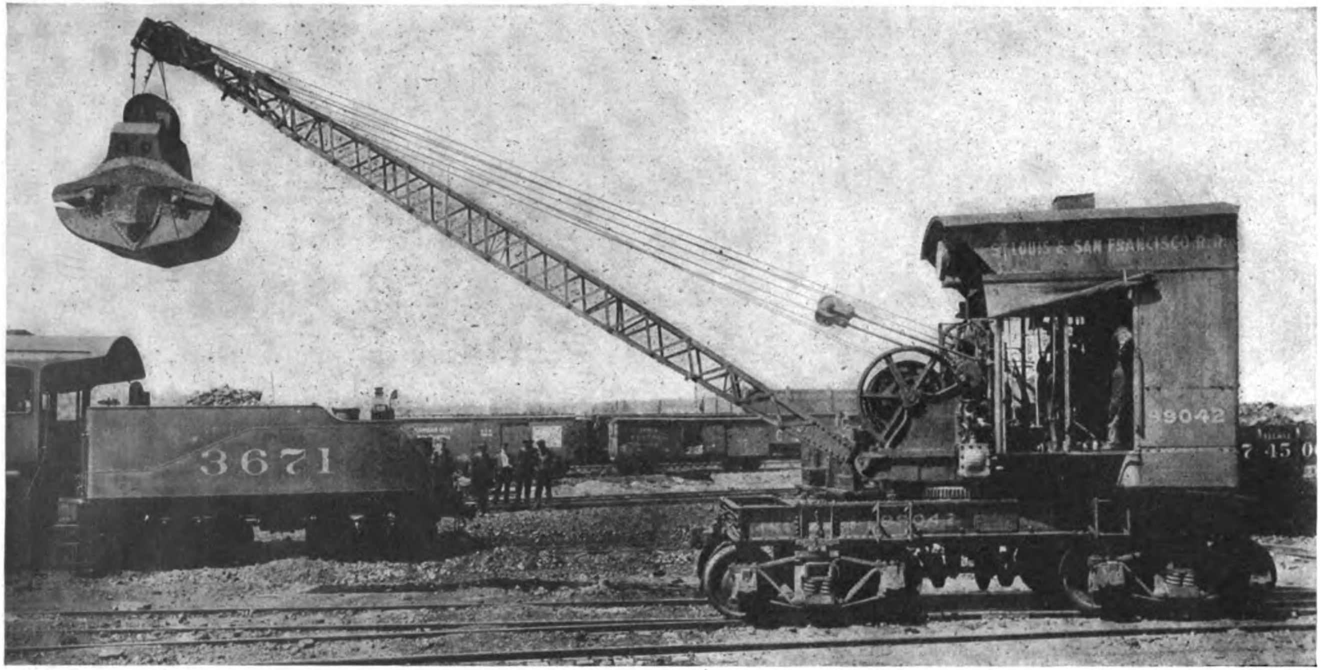

Fig. 1. LOCOMOTIVE COALING CRANE, ST. LOUIS & SAN FRANCISCO RAILROAD

head so that the bucket can be hung to work parallel to the length of the boom or crosswise to it, this being of importance when the crane is working in cars.

The two-rope coal grab bucket is so designed that the entire weight rests on the cutting edges of the blades, and it will be noted that the sides of the spades are cut away so that when closing the bucket blade will not skid over lumps, thus decreasing the efficiency of the bucket.

As noted in the illustration, Fig. 2, the shape of the bucket when open is so designed that it will work in the ends and corners of the gondola cars, practically cleaning out one of these cars of coal without resorting to hand shoveling.

In most of the coal handling apparatus every effort is made to do away with hand labor and make the mechanical appliances clean up their work as far as possible.

It is maintained that this bucket does not damage the vessels or gondola cars, as it is opened by gravity, and therefore the bucket need not be dropped on the pile. Bronze rope guards are employed on the bucket head, so that the wear on the crane ropes is said to be a minimum, while the bucket's sheaves are said to be fully protected so that the material being handled cannot get into the sheaves, and the bucket, it is maintained, will work in any grade of coal from run of mine to slack.

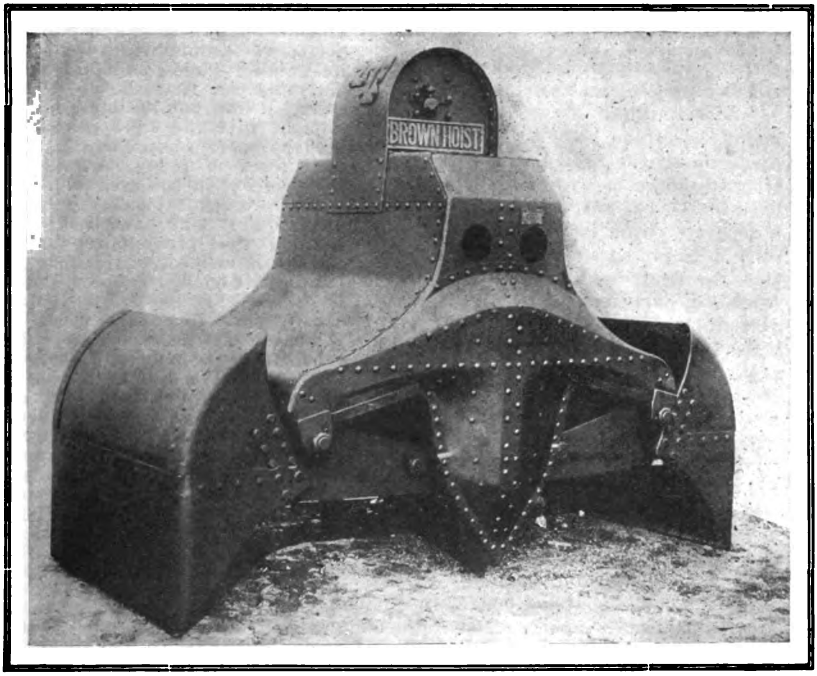

Fig. 2. GRAB BUCKET FOR LOCOMOTIVE COALING CRANE

Locomotive Development in the Far East.

There has lately been introduced into service on the Peking-Hankow Railway, a system with more than 800 miles of 4 feet 8½-inch gauge, controlled by the Imperial Chinese Railway Administration, a special type of articulated 0-6-2:2-6-0 tank locomotive. This locomotive follows closely the design of the articulated engines introduced some years ago by Mons. du Bousquet, the chief mechanical engineer of the Nord of France Railway, for working the heavy coal traffic from the Lens coal basin, in which service they have proved to be eminently successful. The engine is of the four-cylinder compound pattern, and in addition to having six coupled wheels each bogie is fitted with a pair of carrying wheels in front of the cylinders. The coupled wheels have each a diameter of 4 feet 9¼ inches and the carrying wheels a diameter of 2 feet 9½ inches. The high-pressure cylinders, which are 15¾ inches by 26¾ inches, drive the rear bogie, whilst the low-pressure cylinders, which are 24¾ inches by 26¾ inches, actuate the front bogie, but when a large tractive effort is necessary, each pair of cylinders can receive live steam, thereby very materially increasing the tractive force of the machine. The boiler and side tanks, etc., are carried on a main underframe, which, in turn, rests upon the bogie frames. Steam passes from the boiler to a rotatable joint at the back of the fire box, and from this joint a separate steam pipe supplies steam to each high-pressure cylinder. In order that the front bogie may be sufficiently loaded, a portion of the water tanks is arranged on this bogie—sufficient space being allowed between the boiler and the tanks to admit of the angular movement of the front bogie. The front tanks have a capacity of 1,980 gallons of water, whilst the remainder of the water tanks, which are arranged on either side of the fire box and are supported by the central girder, have a carrying capacity of 836 gallons. The boiler of the locomotives for the Peking-Hankow Railway follows somewhat the standard pattern used on the famous de Glehn compound express passenger engines of the Nord of France line, although it has an increased grate area, and is provided with somewhat longer tubes than is ordinarily the case. The boiler barrel has a length of 15 feet 10¼ inches and a diameter of 4 feet 9¼ inches, whilst its center line is "pitched" no less than 9 feet 2¼ inches above rail level. The total heating surface is 2,632.06 square feet, to which the tubes (130 in number and of the "Serve" pattern) contribute 2,503.3 square feet and the fire box the remaining 129.06 square feet. The grate area is 32.29 square feet and the working pressure of the boiler 214.7 pounds per square inch. In working order the engine weighs 102 tons, although the maximum load on any pair of wheels is only 15 tons. The engine was built by the Societe Anonyme des Forges, Usines et Fonderies, de et a Haine-St.-Pierre, of Belgium.—Indian Engraving.

Some Features of the Present Steel-Rail Situation.[*]

The Bessemer steel rail has a marvelous history. The outgrowth of an attempt to make wrought-iron cheaply, it came in just at the time when the wrought-iron rail was beginning to demonstrate its unfitness to stand the pounding of the larger locomotives of the day. It perhaps is not too much to say that the Bessemer steel rail has made the modern railroad possible, and that without it, or its equivalent, the world's development would be half a century behind its present advanced position. And yet, notwithstanding all its merits, and its wonderful record in the past, no candid mind can view the present steel-rail situation and not be impressed with the thought that the steel railroad rail, or perhaps more comprehensively the railroad *track* of today, is called upon to justify itself in the eyes of the public.

No record of past success, however wonderful it may have been, will suffice to met the present conditions. The changes in methods of transportation during the last quarter century, the increases in sizes of cars and locomotives, with the consequent increases in wheel-loads and in the strains produced, have made new demands upon railroad track, and especially upon the rail as the most important element in the track. It is plain, we think, that modifications at some point, and possibly at many points, are essential in order that the new conditions may be successfully met. The startling record of rail breakages which has characterized the past two or three years, the rapid wear, and the almost appalling deterioration due to crushing and flattening of rails in track have produced an outcry against the steel rail, which, seconded by the technical press, has culminated during the past two years in a charge of criminal negligence on the part of those engaged in the manufacture of this great essential of railroad operation. No one at all conversant with the situation can successfully maintain that the subject is not a pressing one, and I am sure that all will agree that there is necessity for calm, cool, dispassionate consideration of the various elements involved in the problem. Perhaps you will bear with me while I attempt to discuss some features of this most important and most interesting situation.

The Change in Rail Duty.

And first let us briefly consider the changed conditions. It is surely not too much to say that in the past twenty-five years the changes in the conditions in which the rail is involved have in three respects been most noteworthy. First, the average speed of trains has been largely increased; second, the average wheel-loads of cars have been increased 75 per cent. and of locomotives over 100 per cent; and, third, on some of the larger and more important railroads the volume of traffic has increased at least 300 per cent. and perhaps more.

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[*] Presidential address before the American Society for Testing Materials, June 25, 1908, by Charles B. Dudley, Chemist, Pennsylvania R. R., Altoona, Pa.—Reproduced from Engineering News.

The Higher Speed.—The influence of increased speed on the life of the rail is not easy to estimate, nor, indeed, can much that is positive be said on this head. Undoubtedly some of the shocks which the rail must sustain are increased in severity by higher speed. This, we think, is clearly the case when a higher-speed train passes over a loose joint. The end of the rail to which the wheel is approaching must have a more severe blow with a fast train than is given by a slower-moving one. On the other hand, there seems to be some evidence that for those strains whose severity is affected by the length of time the load is applied the increase in speed may not be so injurious an element. We are all familiar with the fact that on thin ice the boy who goes rapidly is less liable to break through and get a ducking than one who moves more slowly, and in exactly the same manner the quick stepper sinks less deeply into semi-plastic mud than the one who goes with slower, measured tread.

The Higher Load.—The increase in wheel-loads is a more important matter. Without going into the mathematics involved, and ignoring the apparently unsolved problem as to whether the rail under a moving load acts exactly like a beam supported at both ends and loaded in the middle, there is seemingly fairly good evidence that, all things else remaining the same, doubling the wheel-load approximately doubles the strain in the metal. It follows, therefore, when wheel-loads are doubled, either that the rail section and supports in use at the time must have sufficient margin in them to safely endure these doubled strains, or that some changes are essential.

The Increased Traffic.—The increase in traffic is also a very important matter. No point in the science of strength of materials, if we may use the expression, is apparently better established than that repetition of stress has a direct bearing on the life of the part strained. There is much indication, and the evidence is rapidly increasing, that the life of a rail, not only as regards wear, but also as regards its freedom from disintegration and breakage, is a function of the number of wheel-loads that pass over it. We are strongly inclined to the view, therefore, that we are on firm ground when we say that even though we grant that the rails made twenty to twenty-five years ago were good and gave satisfactory service, it is as clear as noonday that the changed conditions of the present day, especially the heavier wheel-loads and the increase in traffic, demand changes in the practices that were prevalent at that time. No one, we are confident, will dispute this position, and I doubt not every railroad engineer within the sound of my voice will say to himself, "We do not expect the old rail to be satisfactory under the new conditions; many changes have been made, and yet the rails are unsatisfactory."

The Change in the Rail.

Let us examine this matter a little, and ask ourselves the question plainly: What have the railroads done to meet the changed conditions? First and foremost, the weight of the rail per yard has been increased. As a matter of record it may not be amiss to mention the successive steps of this increase on one large railroad. Within my own memory and study of this subject, the following weights of rail have been employed: 50 pounds per yard, 60, 67, 70, 75, 85 and 100. The increase is quite noticeable, the latest form being nearly double the weight of that first used. The battle of the sections, or the form in which the increase of weight has been disposed, will be referred to later on.

But it may be said: "It is granted that the weight of rail has been increased, but what evidence is there that the increase has been sufficient? Is not a rail weighing 110, 120 or even 130 lbs. per yard essential to meet the strains produced by the changed conditions above referred to?" Upon this point it is possible to say that most careful studies have been made, using the best obtainable data, and making allowances for what is more or less unknown and uncertain, and that the studies indicate that the weight of rail to carry the increased wheel-loads has been increased more rapidly than the wheel-loads, and that the actual strain in the rail is no greater than was the case in the lighter rails under the lighter wheel-loads formerly employed. It may be added that if 12,500 lbs. per square inch is assumed as a safe working stress for such steel as rails are made of, the present 90 and 100-lb. rails show stresses well within this limit, even under a static wheel-load of 30,000 pounds with a dynamic augment of 60 per cent. of the static load. If these studies can be trusted, therefore, it would seem that so far as weight of rail is concerned the railroads have done all that could reasonably be required to meet the changed conditions with which we are dealing.

The Influence of Track Construction.

But again it may fairly be asked, we think, whether increase in weight of rail is all that is required. No principle of structural construction is better established, apparently, than that the support which material under strain receives is an essential element in its successful behavior. The rail alone cannot carry the load. It must be properly supported and perhaps—mind you, I say perhaps—failure to properly support the rail may account for some of the rail failures of which we have heard so much during the past few years. Good railroad track involves a properly drained sub-grade, ballast, ties and rail fastenings, splice bars and other joint material, and the proper maintenance of these, as well as rails. In other words, the rails are only one of the elements in the problem; I grant you, the most important one, but still not the only one. It would be manifestly unfair to blame the rail for failures which may be clearly due to defective support or fastenings.

What, then, have the railroads done during the past fifteen to twenty years in the way of supporting the rail to enable it to successfully meet the changed conditions we are discussing? First, as to ties.

The Tie.—It is well known that with the advent of the heavier rail some railroads actually *diminished* the number of ties per rail. This may have been all right during the transition period, but it is manifest that the strain in the rail is increased by such practice. More recently, as the number of heavier cars and locomotives has increased, we believe the number of ties has been increased again, until now in the best tracks as many ties are used as can successfully be employed and yet leave room for tamping. It may not be amiss here to call attention to a characteristic of ties that bids fair to be of increased importance as time progresses. Owing to the continually diminishing supply of forest products, it seems fair to expect that the supporting face of the tie under the rail will gradually get less, as the necessity for using smaller ties increases. This will clearly lead to an increase in strain in the rail, and may even now be an element in the problem. Perhaps the general use of a tie plate on wooden ties, or of the development of an entirely successful steel tie, may obviate this difficulty before it becomes too serious.

Joints and Fastenings.—The joint and the splice bar and fastening have received an immense amount of study during the past twenty years, and while it would probably be too much to claim that the problem has been completely solved, no accusation that the railroads have been idle in this respect can be successfully maintained.

The Ballast.—The ballast holds the ties in place, distributes the strain produced by the load to the sub-grade beneath, and undoubtedly performs some function in drainage. Taken in general, it is undoubted that there has been gradual increase in ballast as the wheel-loads and traffic have increased. That it has reached the proper thickness yet, even on those tracks which are best maintained, we fancy no one would be willing to affirm. We believe there are engineers who think that twice or even three times the present standard thickness of ballast is requisite in order that the load may be properly distributed over the supporting surface beneath.

The Subgrade.—The subgrade is the foundation, and as such is unquestionably one of the most important elements in the problem. No amount of money spent on rails, ties, splices and ballast will give successful results on an inferior subgrade. Our belief is that the importance of the subgrade has not been sufficiently appreciated by engineers in the past. Indeed, there are indications that rail failures are a question of *geography*. The same rail, with the same locomotives and cars, and the same density of traffic, will have far less failures if the subgrade is sandy, porous and well drained than if the subgrade is dense, heavy clay, which tenaciously holds water and for quite a portion of the year may be called a more or less modified mudhole. The great enemy of the trackman is water, and our firm belief is that if more study had been put on the problem of keeping water out of the subgrade fewer rail failures would have characterized the past.

The maintenance of track, that is, the amount of money and labor put upon the track to keep it up to its work, tamping ties, screwing up track bolts, keeping up renewals, giving heed to drainage, etc., has necessarily increased as the wheel-loads have become heavier and the density of traffic has increased. I know of no evidence that indicates that there has been a blameworthy falling off in any of these respects with the advent of the heavier rail. It is undoubtedly true that track expenses, even with the same maintenance of line and surface, show a tendency to diminish the heavier the rail. It is easy to see why this should be so, since the heavier and stiffer the beam the more the strains produced by the moving load are distributed, and consequently the less need that money should be spent to cause each minute part of the support to do its maximum duty.

The Rail vs. Track Maintenance.

And this brings us to an exceedingly interesting phase of the rail problem. During the past year or two, in discussions and committee meetings over rail specifications, the desire on the part of some railroad engineers has occasionally cropped out to have a rail of minimum weight per yard, and yet so good that even though the track might not always in every detail be kept up to standard there would still be no failures. According to their view, if the rails were what they should be, inferior track maintenance would be a very small matter. And sigularly enough, it seemed to be a little difficult for these engineers to see that this unloading of the whole problem upon the steel-rail manufacturers was not entirely legitimate and praiseworthy. We hope to pay our respects to the steel-rail manufacturers a little later, but we are compelled to say that this view of the case does not commend itself to us, and we do not think responsibility can be so easily shifted to other shoulders. No one can be more desirous of good rails than we are, but failures in track maintenance can not, we think, fairly be put upon the rail. On the other hand, we do think there is a legitimate question connected with this phase of our subject. This is, the requisite safety being always maintained, where does true economy lie in this contest between the rail and the track maintenance? There are three possibilities.

(1) Would better rails with the same weights per yard as are now in use, even though obtained at increased cost, result in such diminution of track expenses that economy would result?

(2) Would the same so-called inferior grades of steel now being furnished, with increased weights per yard (it being conceded that increased weights per yard are not essential from the standpoint of strains), result in such diminution of track expenses that economy would follow after paying for the increased weights?

(3) Would better steel *and* increased weights per yard, at even still greater cost, be followed by such saving to other track expenses, that it would be true economy to obtain such rails?

We do not believe the data exists at the present time that would enable a satisfactory answer to be given to any one of these three questions. And yet they seem to us to open up an extremely important field. It costs a certain amount each year to maintain a mile of track, including rail renewals, and we have never seen any figures that show that the distribution of the expense to each item is such that the sum total is a minimum. Perhaps better rails, perhaps heavier rails, perhaps the two combined, even at greater cost for rails, would bring about this desired result.

Returning now to our query as to what the railroads have done to meet the changed conditions produced during the last twenty years or more by heavier wheel loads and increase of traffic. It is difficult to see how any fairminded person can think that the railroads, taken generally and as a whole, have not made a sincere effort to meet these changed conditions. It is granted that the action taken may not always have been the wisest action, that failures and mistakes have been made; and indeed, it is undoubted that at times and places more vigorous action should have been taken, and that too frequently there has been a disposition to lay the whole burden upon the steel maker. And yet, notwithstanding all this, it would, we think, be hard to maintain that there has not been much sincere, conscientious and faithful effort on the part of the railroads to meet the problems due to changed conditions, with which they have been confronted.

The Attitude of the Rail Makers.

Let us turn now to the record of the steel-rail manufacturer in this matter, and ask ourselves calmly and dispassionately, what has he done during the past fifteen or twenty years to assist in meeting the changed conditions about which so much has already been said. Has he made better steel? Has he spent time and money and brain power in faithfully trying to improve his product? Has he heartily and earnestly co-operated with the railroad engineer, in his efforts to secure safe transportation of persons and property?

Before trying to answer these questions let us spend a moment with this problem of responsibility. It has already been hinted several times that there are railroad engineers who would be quite willing to put the whole burden of rail failures on the steel makers, and on the other hand, it is quite as certain that the steel makers seem to have been not only willing, but as a matter of fact have again and again washed their own hands entirely of responsibility in this matter, and claimed that it was simply a question for the inspectors and engineers. We have heard them say in effect, not once, but many times, "Our mills are open to you. Here are the rails. Take them or leave them," thus practically putting the whole responsibility of accepting and using defective and inferior material upon those who from the nature of the case can not know as well as the manufacturer which are good and which are bad, and who many times have no alternative but to take what they can get.

Not so do we understand the relation between the producer and consumer. From the nature of the case the producer has essential information that the consumer does not have, and on the other hand the consumer has essential information that the producer does not have, and it is only by working together conscientiously, honestly and harmoniously, that the best results can be obtained. We do not understand that the manufacturer of any material for the use of a public-service corporation, where safety to human life is involved, can properly assume an air of indifference, can hold back essential information which he as the maker of the material has and the consumer not, or can justly fail to cooperate in every reasonable way to the end that only safe material goes into the tracks.

The making of steel rails for use under high-speed passenger trains is something more than a mere commercial proposition. Both the producer and the consumer have great responsibilities in this matter, and neither can lay them aside or shift them upon the other.

Coming back now to our query as to the behavior of the rail manufacturers during the past fifteen to twenty years. We are frank to say that with the most sincere desire to be strictly fair in this matter, we can not regard this behavior as eminently praiseworthy. There has been far too much antagonism, far too much holding back essential information, and far too great a failure to co-operate. Many within the sound of my voice will bear me witness that in conferences over rail specifications it has many times been simply impossible to get such information from the representatives of the steel makers as would enable critical points in the specifications to be wisely decided. And this is not the worst of the matter. Within two years past, entirely reputable engineers of railroad companies have said in my presence that they had been told by rail manufacturers that if they did not take the rails offered, irrespective of specifications and tests, they would not get any. Still further, if I may judge from my own experience, it is only within the past year or perhaps year and a half that it has been possible to have what might fairly be called a consultation with the experts of the steel rail makers, over any point that involved the quality of the product, in any conciliatory, co-operating way. Far too much we fear the manufacture of steel rails has been studied in the past simply from the commercial standpoint.

And how about the steel itself? Is the steel that goes into rails today better or worse than that made fifteen or twenty years ago? It is well known that there is a general belief among railroad engineers that the steel in the rails today is nothing like as good as it was twenty or twenty-five years ago. We are not quite able to follow these critics to the extent that they want to go on this point. Our judgment is that in two respects there is reason to think the steel in Bessemer rails is inferior to that made twenty-five years ago:

(1) The larger ingots of the present day necessarily lead to increased segregation, and in so far as segregation is a serious element in the quality of steel there is little room for doubt that the steel in the rails of today is inferior to that made some years ago. We think it fair to say that there is need for further study as to how far segregation, apart from internal physical defects with which it is so often associated, is a menace. We can not help wishing that it was not in the rail to anything like as serious an extent as many analyses show it to be, but at the same time, if the ingot was thoroughly sound throughout, we should like to study segregation farther before feeling willing to say the final word.

(2) In so far as the more rapid working of the Bessemer process which has seemed to characterize its full commercial development during the past twenty years or more has led to incomplete action between the final additions and the blown metal, and to higher finishing temperatures in the finished rail, the metal must be inferior. The making of steel is a chemical process, and every chemist knows that all chemical reactions require time, and it is to be feared that Bessemer metal is many times cast in the ingot mold before the reactions are complete. The effect of this is certainly bad. Sound ingots can not be obtained in this way, and if the ingot is unsound, good rails can not be made. Again we are quite well aware that high finishing temperatures are blamed on the rail section. Thin flanges, by getting cool too soon, seem to make it impossible to roll the head at the proper finishing temperature, and it is to be confessed that in as far as the section is responsible for too high finishing temperature the steel maker can not fairly be blamed. But for all other causes leading to too high finishing temperatures, it is difficult to see how the responsibility is to be shifted.

Notwithstanding these, as we regard them, just criticisms of the later made Bessemer steel, it is undoubted that a large percentage of the output of rails of the last twenty years has been approximately as good as that previously made. We are inclined to think that those who so vigorously denounce the later made steel forget the enormously increased traffic which these rails have carried. The lack of reliable figures showing comparative tonnage of the earlier and later made steel is a very serious handicap in reaching a satisfactory conclusion in this matter.

But whether the earlier or later made steel is better or not, it is certain that the need of today is for a steel even better than that earlier made. The speed is greater, the wheel-loads are greater, and the tonnage is greater, and the steel to successfully meet these changed conditions should also be better. Do we find then that during the last twenty years there has been real conscientious study on the part of the Bessemer steel maker as to how to make better rails? Are the ingots any less unsound and more free from shrinkage cavities, pipes, gas bubbles and blow holes? Have any of the suggested means of overcoming or minimizing segregation and diminishing the pipe been tried on Bessemer ingots? Have any of the Bessemer steel rail manufacturers or their experts contributed something toward the solution of the problem of how to secure safer and better rails? Have they welcomed and seemed willing to fairly try suggestions that might possibly lead to improvements in their products? Have they willingly accepted more frequent testing, to the end that inferior material might be kept out of the tracks? In so far as they have done honest conscientious work in any of these directions, let all honor be given them. In so far as they have failed, let us not add to their shame by discussing this phase of our subject farther.

Rail Sections.

Let us turn now to two or three other features of our subject; and first, as to the sections. It has already been hinted that the section has been blamed for some of the difficulties encountered in making good rails. The makers have urged, and we think with good show of reason, that the distribution of metal between the head, web and foot of the rail, in many of the sections, was such that it was practically impossible to finish the heads at the proper temperature. And since the sections were specified by the railroad engineers, the rail makers have felt (and we think justly so) that in so far as the section was an element in good rails they could not be held responsible for poor rails. This criticism was felt to be so valid that within the past two years two independent organizations have taken up the question of section de novo. One large railroad through a committee of its own officers, reinforced by practical rail manufacturers, and the American Railway Association, through one of its own committees, assisted also by a number of practical rail makers, have both, but independently, devoted much study to the section. The results of their deliberations have culminated in three types of sections.

The one, known as Section A of the American Railway Association, is characterized by a shallower head, wider base, with thin flanges, and a greater height of section than either of the other two. Regarded as a beam or girder, this section is undoubtedly the strongest section of the three. It is apparently advocated by those who think that more of the duty of the track should be borne by the rail, and less by the other elements. It is obvious, as has already been stated, that the stronger the rail as a beam or girder, the more the strains are distributed, and the less need therefore for exacting attention to the other features of track maintenance. Its advocates think that the distribution of metal between head, web and foot is such that the rolling difficulties, and especially the question of finishing temperatures, can be met with entire success. It would be a bold man who would be willing to affirm that this section will not ultimately prove to be the best of those under consideration, and especially that the transference of more of the duty to the rail, will not result as has already been indicated, in ultimate track economy. Those who oppose this section fear that the shallow head is an element of weakness. According to their view, with such steel as it is at present possible to get in rails the pounding of the heavy traffic will lead to such crushing and splitting of the heads, owing to internal physical defects in the metal, that the section will prove a failure, especially on roads with heavy wheel loads and dense traffic.

The second type of section, known as Section B of the American Railway Association, is modified to meet this latter view. The head is practically the head of the American Society of Civil Engineers' section, thicker flanges, less height over all, and the same thickness of web. The distribution of metal is believed, as in Section A, to successfully meet the manufacturers' criticisms, the head and foot having slightly over 40 per cent. each of the metal and the web the balance. This section is confessedly a compromise, but there goes with it the hope that it will ultimately prove itself worthy of being adopted as the standard recommended section of the association. This section is weaker as a girder than the "A" section, but is believed to have sufficient factor of safety so that no difficulties will arise from this cause. These two sections have been proposed as "recommended practice" by the American Railway Association, and the question as to which is the better of the two, or indeed as to whether some other section is not still better than either, has been referred to the American Engineering and Maintenance-of-Way Association, an organization composed largely of railroads operating officers, to study and accumulate data, and make a report after the sections have been tried in actual service.

The third section, known as the "P. S. section" of the Pennsylvania system, is a step farther away from the "A" section. It has a still heavier head, a narrower base, thicker flanges, and the same thickness of web, as the "B" section. The radius of the web is smaller, thus producing more of a buttress where the head and web join. The experience of the Pennsylvania system seems to be that with their heavy wheel loads and dense traffic, and with the grade of steel that it is now possible to get in rails, more rails fail from crushing and disintegration of the head, apparently due to the pounding of the traffic, than from any other one cause, and accordingly in this section the maximum effort has been made to strengthen the head in its weakest point. The distribution of the metal is satisfactory, and the strength of the rail as a girder or beam is practically the same as the "B" section, and is believed to be abundant for present conditions.

Which if any of these three sections will survive and become the standard section of the railway world in this country, it is of course impossible at the present moment to say. However, the issue is now clearly defined as never before, and the different ideas prevailing among expert engineers are clearly represented in the types presented. All the sections have been designed to meet the criticism of the steel makers, so that from this time forward, if these sections are used, there should be no excuse for improper finishing temperatures. It may happen that progress in steel metallurgy will so diminish physical defects in the steel, and so minimize the adverse effect of segregation, that all three sections will be found worthy of perpetuation. It is believed that a decided step forward has been taken by the preparation of these three sections, and much is expected from them in the next few years to come.

Discard from Ingot.

The question of the discard has occasioned many words during the discussions of the past two years, and we had almost said bitter words. There is material enough in this feature of our subject for a long paper. I fancy many of us had more positive ideas on discard three or four years ago than we have at the present moment. The more the subject is studied the more difficult it becomes, seemingly, to express a final opinion that we are willing to stand by. If every ingot solidified in the typical way, and was like every other ingot, the question of discard would be easy. But it would almost seem as though every heat of steel was a law unto itself, and was different from every other heat of steel, and nearly the same might be said of every ingot. When we come to consider the conditions there seems to be much reason why this should be so. The differences in temperature at the time of casting; the more or less incompleteness of the chemical reactions when the metal leaves the ladle; the differences in chemical composition of the different heats; the rate of pouring, the differences in the condition of the molds; the differences in rate of cooling dependent on surrounding conditions; the differences in practice at the different works, especially in the matter of covering and artificially cooling the top of the ingot; the length of time that elapses before the ingots are shipped; and the more or less fluid condition of the metal on the inside of the ingot when it reaches the first pass, to say nothing of accidents or mishaps that may occur in handling the semi-fluid ingots; all have an influence on the location of that part of the ingot which is supposed to contain the poorest of the metal, and which it is the object of the discard to prevent from getting into the rails.

In view of these uncertainties, we can not but think that the position taken by the Pennsylvania system and American Railway Association in their proposed specifications is the most reasonable one, viz., to leave the discard to the manufacturers, and to safeguard the product by proper tests, especially by choosing the test piece from such a location, and making the rejections such, that it will be to the interest of the manufacturer to voluntarily discard the metal which will not stand test. This has been our practice at Altoona for many years. We have a number of specifications for different steel products in which the word "discard" does not occur and never has.

An illustration will perhaps make this whole matter clear. When our axle specification was issued the whole question of discard was most carefully considered, and it was finally decided to select one axle at random for test from each heat of steel, after the axles from that heat had all been made up, stamped with the heat number and put in a pile by themselves; and further, if the test axle stood all the tests, all the axles made from that heat were accepted, and if not all were rejected. After the specification had been in operation a short time, a manufacturer who had worked with us during the development of the specification said to us, "There is steel enough in each one of our ingots to make 13 axles of the size you are now using. As a matter of fact we only make and offer you for test nine, for if we should make the whole ingot into axles, and you should get for test one made from the steel which we now discard, you would condemn the whole heat, quite to our loss." We are firmly of the opinion that the matter of testing rails can be so handled as to give similar satisfactory results.

The Evil of the Retest.

And this brings us to the question of tests and testing. During the past few years much light has been thrown on this subject, and the truth compels us to say that a situation has been found that in some respects would be ludicrous if it was not so near the tragic. Let us see what the conditions have been:

(1) The manufacturers have, in many cases at least, selected the rail end as sample for test. The specifications being silent on the selection of the test-piece, they naturally have urged that there was nothing to prevent their doing this, and they naturally again have, so far as information can be obtained, chosen the best steel in the ingot for test. It is not claimed that all specifications have been so loosely drawn as to permit such a suicidal practice, but it is certain that some of them have, and that the practice has been in vogue.

(2) The "best two in three" principle has pervaded many specifications, that is to say, if the first rail-end stood test, the heat was accepted, but if it failed a second was tested. If this likewise failed, the heat was condemned. If, on the other hand, it stood test, a third was tested, and the fate of the heat was decided by the majority. It would almost seem as though the specification had been drawn, not with the idea of being sure that only good rails should be accepted, but with the idea of being sure that as many heats as possible should be accepted.

(3) Only one heat in five was tested, that is to say, as we understand the matter, if the rail-end stood test and the heat was accepted, that acceptance carried *four other heats* with it. But singularly enough, if on the other hand the heat was rejected, that rejection only covered the heat from which the test rail end came, and the four preceding or following heats, as the case might be, got another chance for their lives. The unsatisfactoriness of such a method of testing, it seems to us, must be evident to every candid mind that

knows anything about the making of steel. As has already been stated, every heat of steel is a law unto itself, and there is no certainty that because one heat or blow is good the preceding or succeeding four are equally good, any more than there is a reasonable presumption that if one heat is bad, the preceding or succeeding four are likewise bad. And while it is agreed that, when everything is working well, successive blows from the Bessemer converter may be similar in many respects, it is not agreed that testing one blow in five gives any reasonable assurance that only good rails are accepted for use in the tracks.

We fancy the rather loose testing described in the three items above started in the earlier days, when the strain on the rail was far less than at present, and the traffic far less dense, and has been perpetuated partly owing to inertia on the part of railroad engineers and partly owing to the resistance of the rail manufacturers. The wonder is, with such loose, log-rolling testing as has been in vogue, not that there have been so many rail failures but that there have not been more.

But this is not the whole story. Until quite recently the specifications have been equally loose in regard to the drop-testing machine employed in making the tests. Weight of tup has been carefully stated, and the height from which it must fall has been given, indeed in some cases the foot pounds of the blow are carefully given for each weight of rail; but it has apparently been forgotten that the anvil or support on which the rail rests when it receives the blow, is a most important element in the problem. It has recently developed that at one steel works the anvil was a couple of ingots laid down side by side, with appliances for holding them in place and supporting the test rail, the whole resting on boards placed on the ground. At another steel works, the anvil weighed 3,000 lbs. and rested on boards, stones and gravel. One rail manufacturer recently said in my hearing, "As long as the railroads did not object, why should we take measures to increase the severity of the test by putting in heavier or better-supported anvils?" It is gratifying to be able to state that some of the more recent specifications, while according to our ideas, still far from satisfactory in the matter of testing, do show marked improvement in some of the respects mentioned above, and still better that the rail manufacturers are co-operating in and actually suggesting some of the improvements.

A few words now in regard to some of the details of testing rails; and first in regard to the drop test. It is well known that many testing engineers do not favor the drop test for rails. To our minds, however, it is the only possible available one for the present, and the following considerations seem to us to have weight in confirming this view:

(1) It tests the whole rail in the condition in which it goes into the track, instead of a small fraction of the rail, as is requisite in all cases of prepared test pieces.

(2) It is sufficiently rapid so that even though every blow is tested there is no fear of delaying the output of the mills while waiting for test-pieces to be prepared or for slower tests to be made. We have known of a case where, with sufficient force to handle the test samples, fifty-five tests have been made in half an hour on a modern drop-testing machine.

(3) There seems little doubt but that some of the strains or shocks which the rail actually receives in track are similar to those produced by the drop-testing machine. This is, we think, clearly the case with a loose joint and a rapidly moving train. In case the track bolts have become loosened, the end of the rail, when the approaching wheel mounts it, certainly gets a blow similar to that given by the drop-testing machine. We have known rails which have given long service in track, to be broken in this way, and the fracture showed perfectly clean, sound metal.

(4) Finally, if the specification requires that the deflection be taken, the drop-test reveals a good deal in regard to the physical properties of the steel.

Second in regard to the selection of the test-piece. We fancy it goes almost without saying, that this should always be made by the inspector. In regard to location of test-piece, it is of course understood that in shearing the ingot into rail blooms it is necessary to make the bloom from which the test rail-end is to be taken a little longer than the others. It is therefore essential that the inspector or the specification should designate the bloom from which the test will be taken. Some recent specifications, wisely, we think, designate the top bloom of the ingot for this purpose, it being generally understood that the so-called "pipe," if there be any, and the greatest segregation and physical defects will be in this bloom. We may perhaps wisely call attention to the fact that if a cover and cooling devices are used on the top of the ingot when it is cast, the poorest steel in the ingot will not be near the top end of the top bloom, but more probably near the bottom end of the top bloom, so that if the inspector takes his test-piece from the top end of the rail made from the top bloom he will be more apt to deceive himself than if he has the test-piece cut from the bottom end of the top bloom. We have sometimes thought, when inspecting the practice of casting and cooling ingots in certain works, that it would be better to take the discard between the first and second blooms.

Third, in regard to height of drop. We have always opposed extreme severity of tests. Owing to the defects in the anvil previously referred to, if indeed they have been general, it is apparent that but little information that is of value and that is safe to follow can be obtained from previous tests. Our own view is that something a little more severe than the rail will receive in actual service, enough for a reasonable factor of safety, is all sufficient. The trouble is we do not know how severe the shocks in service are. Some recent tests of rails which had broken short off in track, made by the Research Committee of the Pennsylvania system, seem to indicate that a fifteen-foot drop with a 2,000-lb. tup and a 20,000-lb. anvil, would have rejected two-thirds of those which failed in service; also that the fifteen-foot drop actually broke as many test-pieces as the 19-foot drop, other conditions being the same. These tests should be much amplified before final conclusions can be reached, but as far as they go they seem to indicate that we must look to other causes than defective or poor steel for a portion of the rail breakages, and that extremely severe testing is not necessary.

We have taken so much time with what precedes, that there is no opportunity to discuss a number of other features of the rail situation. The subject is far too large for a single paper. It would be interesting to consider quite at length how to manage the results of tests in such a way as to be strictly fair to the manufacturers, and at the same time prevent the acceptance of inferior or defective rails. We would suggest that those especially interested study the specifications of the Pennsylvania system recently issued, and those of the American Railway Association, proposed at its recent meeting in New York City, April 22, 1908. Much might be written on the chemistry of the steel rail, and especially the phosphorus limit; also on open-hearth steel rails, but time and space forbid. The wear of rails has not been touched at all, and must be deferred to another occasion.

Summing up and putting in concrete form our views on the present situation, we are inclined to say:

(1) The crying need of the hour is positive, definite information. Upon dozens of points no positive data exist. During the discussions of the past two years or more, opinions have been as plentiful as leaves in autumn, but of positive, reliable, statistical information, or figures taken from properly kept records, there has been a dearth that was fairly oppressive. The steel makers have not been as deficient in this respect as the railroad engineers.

(2) The time seems opportune for genuine progress to be made. The railroads through their organization, which in a sense speaks for them all, the American Railway Association, have taken hold of the matter with vigor, and have developed a large amount of valuable information, and for the first time in my twenty-five years' study of this subject the steel rail-manufacturers have shown a less antagonistic and more conciliatory and co-operative spirit than has usually characterized them.

(3) The specifications proposed by the Pennsylvania Railroad system and by the American Railway Association seem to us to represent genuine progress, and to be worthy of most careful study and trial. While they may be said to represent perhaps the best that can be done, until more positive knowledge is obtained he would be a bold man that would claim that they will ultimately be satisfactory or final.

(4) Whether the Bessemer process can be so modified and improved as to enable it to furnish rails that will be entirely satisfactory under the heavier wheel-loads and denser traffic of today and the near future, or whether the basic open-hearth will soon be the source from which steel for these rails will be furnished, are questions worthy of serious attention. Our own feeling is that if a small fraction of the time and money that has been spent in the past over the commercial development of the Bessemer process shall in the next few years be spent in getting sound ingots, free from blow holes, slag and manganese sulphide (if this shall be found to be as serious as it now looks), and in overcoming or minimizing segregation, it will last for many years to come.

(5) The American Society for Testing Materials has a most important duty to perform at this juncture. By stimulating the development of information, by furnishing an arena for the presentation of such papers on the metallurgy of steel as are on its program for this meeting, by arousing interest in testing machines and methods of testing, by furnishing a forum where producer and consumer can meet on common ground and discuss their differences unhampered by commercial considerations or by artificial distinctions of professional ethics, and by keeping its own specifications up to date and utilizing new information as fast as it is obtained, it can so fill the field which it occupies that when the ultimate record is made up its contribution will be by no means among the least.

We beg not to be misunderstood in this matter. If we have called attention to loose practices, if we have indicated that as we look at the matter, rail manufacturers have in the past been a little too much actuated by commercial considerations, and have too vigorously antagonized the efforts made by inspectors and engineers to secure better and safer rails for the track, if we have pointed out that in some cases specifications have been loosely drawn, and that tests and inspection have too often been one-sided and inefficient, it has not been for the purpose of holding any one up to ridicule, or to make statements that would appeal to the popular fancy, but with a sincere desire to have the mistakes and shortcomings of the past so well understood that they will not be perpetuated in the future. There is much indication, and it may well be, that what has been done in the past was sufficient for its day. But our sincere belief is that past practices are no longer applicable, and our plea is for more conciliatory and more conscientious action on the part of the rail manufacturers, and for more thorough and exhaustive study of all the elements of safe, economical track on the part of railroad engineers, to the end that the changed conditions about which so much has been said may be successfully met, and the rail transportation interests of the country be put on a safer and better basis.

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Telephone Dispatching Indorsed by Telegraph Superintendents.

The Western division of the American Association of Railway Telegraph Superintendents held a quarterly meeting in Chicago September 17. The Western division embraces all railroads west of the Ohio river. Eighteen roads were represented as follows: C., B. & Q.; C., R. I. & P.; C., M. & St. P.; C. & N. W.; A., T. & S. F.; Missouri Pacific; Union Pacific; Grank Trunk; Cincinnati, New Orleans & Texas Pacific; Great Northern; Wabash; Michigan Central; Pennsylvania Lines West; C., I. & S.; B. & O.; C. & E. I.; Wisconsin Central; Illinois Southern. The meeting was very interesting and productive of many good results. Various subjects relating to service and construction matters, telegraphic and electrical, were discussed and acted upon.

The subject of most interest was that relating to the use of the telephone for the dispatching and blocking of trains. The action taken on this point was indicated briefly in an item in the Railway and Engineering Review last week. While the telephone has been used to quite an extent in railway service for a number of years on branches, yard and terminal lines, etc., its greatest development has been within the last two years, when entire districts have been covered with train dispatching circuits with great success. Reports to the meeting indicated that within two years past over 6,000 miles of road have been placed under telephone operation. Nearly all of this mileage being on heavy divisions, both single and double track.

The advantages as to safety and efficiency accruing through the use of the telephone were brought out, and reports indicated that on divisions so equipped train movements were being greatly expedited, due to its greater speed and flexibility. It was shown that the train dispatcher's duties were lightened, giving him more time to figure out and plan his movements, all of which tends to facilitate train movement and promote safety, operators' duties being likewise lightened.

It was the unanimous judgment of the members present, all of whom were intimately acquainted with and in general charge of train dispatching telephone lines, that the actual use of the telephone for the dispatching and blocking of trains has demonstrated its safety and superiority for such purposes. The following resolution was unanimously adopted:

"Resolved, That in the judgment of this association the use of the telephone in the dispatching and blocking of trains is just as safe, if not safer, than the telegraph, and in addition thereto has many advantages; therefore, we unanimously indorse its use and recommend its further adoption for such purposes."

While the telephone seems destined to replace the telegraph for train movement purposes, due to its many advantages in that particular use, it is not thought that it will replace the telegraph for other communication purposes for many years.—The Railway and Engineering Review.

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*Foreign Railway News Items.**

Government Monopoly of the German Electric Railways.

In these days the finances of the German Empire are, to put it mildly, not very flourishing. All sorts of taxes are proposed as a means of "raising the wind," but still there seems to be the old trouble—too great expense and too small income. The introduction of tax after tax, general or special, seems to have failed to produce the desired result. For instance, the tax on railway tickets of the first, second and third classes seemed only to have driven the public to take one class lower down, all through the scale. The first class rode second, the second class took the third, and the former third flew into the fourth; so that the gross and net income from the railways was less than before.

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*By Dr. Robert Grimshaw, Ingenieur, Dresden, Germany.

There are many monopolies over here—monopolies of the empire, of individual states, and of cities; and now the latest is the proposed purchase, by the imperial government, of all the electric railways and general electric plants. Other monopolies, such as spirits, gas, petroleum and coal, have been proposed, but the latest is one for taking over all the electric railways!

As a matter of fact there is already a monopoly of the oil trade—the Standard Oil Company has had it for a long time, under the name of the Deutsch-Amerikanische Petroleum-Gesellschaft, which has driven out the middlemen, and sells direct to the retailer—and for all we know will be selling to the consumer direct. The alcohol ring controls its own line very effectually; and as far as electricity is concerned, the greater manufacturing firms have long ago made arrangements tending towards fusion; trust after trust has been formed, and a "trust of the trusts" is at hand. We have already the Siemens-Schuckert, the Allgemeine Elektrizitäts-Gesellschaft and the Lahmeyer-Felten-Guilleaume electrical combinations; and it is probably only a matter of time when these three will form a single monopoly.

And now crops up the idea that the government shall buy out all the electric railways for the purpose of making money out of them. The facts that a stock that is paying 20 per cent. is not to be bought at par, and that as a rule government industries employ more hands (and especially more office hands) than private ones, is entirely overlooked—"that is a detail."

As far as petroleum is concerned, it is expected that the Austrian, Russian and Roumanian opposition can be played against the American; but in the matter of electricity it is gravely proposed to make it illegal for any private person, firm, or stock company, to generate electricity for sale.

Of course, "electrifying" the government railways (there are practically no others) greatly increases the amount of current necessary to be generated, and calls for the erection of new central electric stations. As the electrical railway net is extended over the country wherever the railways penetrate, there would be an opportunity of selling current for lighting, heating and power to the small villages and towns.

Of course, this little project calls for buying all the coal mines—which has indeed been proposed already in the interests of national defense. "It would be a pretty state of affairs to own all the railways in the country, to transform them into electric lines, and then find the coal syndicate dictating prices," say the advocates of the system—forgetting, apparently, that the present locomotive system of traction calls for coal, also that some, at least, of the electric lines, could be run by water power, and that it is claimed that a large portion of the profit on the electric monopoly arises from the fact that electric transmission saves fuel.

As regards the cost of the matter—that is also "a detail." The existing electric railways are not to be bought, as the German popular saying is, for the price of a slice of bread and butter.

The following statistics, on the authority of the "Elektrische und Moschinelle Betriebe," show the rapid increase in the number of electric lines in Germany:

In 1890 there were fifteen electric central stations; in 1895, 195; in 1900, 813; in 1905, 1,175; at present, 1,300; and for 1910 it is supposed that there will be at least 2,000. Many of these are private, but there are very important ones under municipal ownership. The amount of capital already invested is shown below:

	Marks.	*Equal to*
Berlin (Berl. El. W.)	89,160,000	$21,220,000
Hamburg (Hamb. El. W.)	35,690,000	8,494,000
*München (also Siemens & Holske)	15,100,000	3,594,000
*Leipzig	4,970,000	1,183,000
*Frankfurt (M.)	11,490,000	2,735,000
*Dresden	14,160,000	3,370,000
*Breslau	9,140,000	2,175,000
*Köln	8,900,000	2,118,000
*Magdeburg	4,470,000	1,064,000
*Stuttgart	8,950,000	2,113,000
*Düsseldorf	6,720,000	1,600,000
*Elberfeld	9,000,000	2,142,000
*Hannover (also municipal street railways and lighting works)	10,700,000	2,547,000
*Königsberg	3,470,000	826,000
*Danzig	2,270,000	540,000
Stettin (Stettiner El. W.)	5,000,000	1,100,000
Bremen	4,190,000	997,000
Strassburg (Strassbg. El. W.)	9,650,000	2,297,000
Mannheim (Brown, Boveri & Co.)	3,290,000	7,830,000
Charlottenburg (Lahmeyer)	4,720,000	1,123,000
Total	261,040,000	$62,128,000

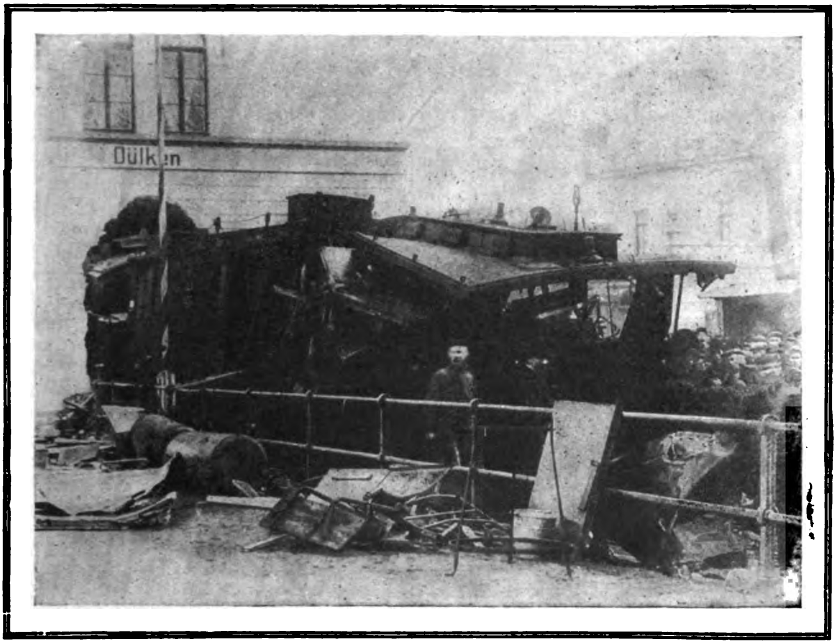
Those marked with * are municipal.

This short list—which, of course, does not comprise all—shows what a vast capital would have to be invested by the Imperial German Government in order to carry out this scheme. If the private companies were not disposed to sell, there would come about an opposition to the government undertaking, which would be very good for the consumer, but would not realize the government's intention of making money out of the matter.

Another thing must be taken into consideration: Suppose that the government were disposed to buy, and the private and city authorities would be willing to sell; or suppose even that the government took possession by expropriation; there would remain the question of electrical supplies; the private companies would have it in their power to run up the prices on the government until the latter was compelled to go into the manufacture of dynamos, motors, etc., in opposition to the private companies—again for the benefit of the people at large, but not quite in line with the idea of a large profit on the part of the government having the monopoly of transportation, and of the electric current for heating, lighting and power.

The Passenger Train in the Station Building

One can have too much of a good thing. Convenience can be overdone. For instance, where a passenger train comes into the station building, as here shown, where the passengers and others in the station at Duelken in Rheinland, Germany, were disagreeably surprised by the sudden and unexpected entrance of the train—not through the door, but through the wall. The accident was caused by a combination of fog (preventing the station signals being seen), and failure of the brakes to stop the train. Unfortunately the accident caused not only the complete wreck of the locomotive and three cars, but the severe injury of eight persons. Naturally, the appearance of the station building was not greatly improved by the additional entrance opening.



WRECK AT DUELKEN IN RHEINLAND, GERMANY

Sudden and unexpected entrance of passenger train through wall of station

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Grate Areas and Heating Surface.

Fashions change from one extreme to the other, and frequently it is impossible to find the reason for the change. The Merry Widow hat and wide fire box are being superseded by hats that do not require extra width doors and fire boxes that do not call for widened tunnels. Adapted from the Wooten fire box, which was designed to meet special conditions, the wide fire box has held sway for some time, upsetting all previous calculations as to grate area, heating surface and the relative proportions of same. Whereas, it has been the accepted practice to design engines burning soft coal with about 70 feet of heating surface to one foot of grate area, there followed engines designed with as low as 40 feet of heating surface to one of grate area, the idea being to reduce the rate of combustion. In many cases the grate area was found excessive, and blank grate bars and bank firing were used to offset this. As a matter of fact, much of the time and thought that have been devoted to getting up the extreme fire box designs could have been well used in so designing boilers as to utilize the waste heat going out of the front end. The extra weight necessary for the wide fire box could have been used nicely in providing additional heating surface.

A comparison of the recent types of heavy power illustrates the extremes of fashion. A Chesapeake & Ohio consolidation, cylinder 22x28, with a grate area of 46.87 square feet, and heating surface of 30.23 square feet, gives a ratio of 1 to 64.5, which is about a mean between the extreme ratios of 1 to 40 and 1 to 80, usually found.

The recent Iowa Central design of consolidation has a grate area of 40 square feet, with heating surface of 2,179 square feet, the ratio being 1 to 54.5.

Then there are the various types of Pacific engines having ratios of 1 to 50 on an average. As compared with these, the recent Chicago and Alton Pacific type presents a radical departure from the prevailing fashion. With cylinders 23x28, a long, narrow fire box, 40 inches by 120 inches, giving a grate area of only 33 square feet and heating surface of 3,927 square feet, the ratio of heating surface to grate area is 1 to 119. This radical departure from both the old accepted ratio of 1 to 70 and the other extreme of 1 to 50, will doubtless be watched with interest, and it is to be hoped that some definite comparative data can be obtained showing the performances of this and the other types with lower ratios. It is clear that the subject of fire box and boiler design is by no means exhausted.—The Railroad Herald.

How Much Territory Should a Road Foreman of Engines Cover? Over How Many Engines and Crews Should He Have Jurisdiction?

Before assigning a territory to a road foreman we should first consider the conditions existing in the same, viz.: The density of traffic, the number of engines used and the condition of the power.

The amount of business done in one territory differs greatly from that in another; and on a congested road where many engines and crews are used, the road foreman should have his territory so arranged that he can cover it often and become acquainted with all the engineers and firemen. This acquaintance enables him to select the men who need instructions and devote his time to those who are most liable to neglect their work.

The territory of a road foreman should not be so large that he could not make the acquaintance of all the engineers and firemen who have worked on his territory a month; and he should not have so many engines that he cannot ride each engine once a month. Then he would know the condition of every engine and how it is being handled by the crew, and would know how the work was done by the men in the roundhouse.

When you find a road foreman who has such close supervision of his territory you can plainly see the results obtained. You will find that the work to be done on the engines will be intelligently reported in the work book; and this in itself is a great saving to the railroad company. It enables the roundhouse forces to begin at the right place to make repairs instead of dismantling an engine to find what is wrong, which is the case if the engineer fails to locate the trouble and writes on the work report book: "Examine this or that." Often high-priced mechanics spend considerable time in trying to find something that does not exist or in locating the actual trouble, which should have been located and intelligently reported by the engineer; then the repairs could have been made at less expense to the company. This is only one of many things that a road foreman can correct when he has a territory that he can cover often.

The savings made by a road foreman

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*Report of committee, Sixteenth Annual Convention, The Traveling Engineers' Association, Detroit, Mich., August 25, 1908.

for the railroad company, if he is given a chance, are large and difficult to estimate. But, like every one else, he must be given a chance to do the work assigned to him; you should not expect one road foreman to cover the territory that three men should have and then expect good results.

One of the main reasons why road foremen are not appreciated on some roads is because they have too much territory to cover and have practically no authority. When a road foreman is spread out so that you can neither see nor feel him in his territory and the engine crews have no speaking acquaintance with him, you cannot expect results; and it would be better to reduce his territory, so he could have an influence over the engine crews. By doing this the saving he can make in coal, oil, engine supplies, cost of repairs, as well as reducing the number of engine failures, will surprise any superintendent of motive power.

One of the drawbacks in the way of many road foremen is that they have been assigned two or three times as much territory as they can cover often, and for this reason they cannot keep up with the work. Consequently the results are not obtained that could have been if the territory had been made small enough that the man working it could get familiar with the conditions and have the time to thoroughly straighten out the difficulties found, instead of just touching the high places and then leaving before the troubles are corrected.

It has been noticed that where a large territory has been divided a decided improvement took place in the number of engine failures, and better service was rendered by the mechanical department; for close supervision on the part of the road foreman places him in constant touch with the men and engines in his charge, and he can then keep them in a high state of efficiency—something that is not possible where he has too many miles of territory to look after.

During the past few years road foremen have had a greater percentage of newly promoted engineers and inexperienced firemen than ever before, and if a road foreman's territory is large it will be impossible for him to keep these men lined up or even to have a speaking acquaintance with many of them. This places the road foreman at a disadvantage, for if any official of a railroad needs to be in close touch with the men under him the road foreman is the one most in need of this personal acquaintance. In a great measure he has to depend on the loyalty of the engine crews to do their work faithfully in his absence, as it is possible for him to be with them only occasionally, and there are many things that engine crews can do to cause engine failures or increase the cost of repairs if they are not loyal to their duties. On the other hand, when you find a road foreman who knows all his men and keeps in close touch with them you will find the majority of these men doing all they can to get their engines over the division with a full train and with as little delay as possible. This, of course, means better service and increased revenue to the railroad company.

The road foreman, to be successful, must have the confidence of his men, and he should have them feel that he is the doctor for all their troubles; by being a good listener he will soon be able to judge how bad the patient is and suggest a remedy. From their reports he can show the master mechanic and foreman the necessity of having such work done on the engines as will keep them in condition to successfully handle trains over the road.

The number of engines and crews under the jurisdiction of a road foreman is largely determined by the density of the traffic. On a division where the business is very heavy a road foreman can look after more engines and crews than he could if the same number were spread out over several hundred miles and where much time is lost in reaching them, due to the limited train service, and perhaps a whole day would be consumed in riding one engine. It may be said that it would not pay to lose all this time to ride one engine, but often where you have a case of this kind the crew may need instructions, and one hour's time of a road foreman with an engine crew handling a train on the road will give him a better knowledge of the ability of the engineer and fireman than all the roundhouse talk he can get.

On a division where traffic is heavy a road foreman could look after 125 engines. This would mean about 175 engine crews, but this is a large force of men for one road foreman to handle, and better results would be had if it were divided.

On lines that run through sparsely settled country and where from 500 to 700 miles of road must be covered, ninety to one hundred engines are a large number for one man to look after, and actual experience teaches that better results have been obtained with a smaller number.

Most road foremen closely watch the mileage made by their engines and make extra efforts to have them make the greatest number of miles possible between shopping.

By giving special attention to engines that are about ready for shop repair they have been kept out of the shop from one to three months longer; but this can only be accomplished when the number of engines is not too large for the road foreman to give them his personal attention. Engines have often been booked for the shop by the engineer and roundhouse foreman, but after the road foreman had made running repairs and put the engine in the hands of a good crew it has run from one to three months and given good service. This is one of the strong points of a road foreman, and one that cannot be overestimated when the road is short of power and the shop has a large waiting list of shop engines.

In conclusion, your committee does not favor assigning to a road foreman more engines than he can ride once each month, nor more engine crews than he can personally supervise.

The committee consisted of C. F. Richardson, chairman; W. J. Anthony, A. J. McKillop, Chas. Stark and P. H. Stack.

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A New Departure in Signaling,

It is reported that in the new passenger station in Washington, D. C., in addition to the customary signal system there has been installed an auxiliary plant of whistle signals. These are located on the signal bridges above the tracks, and are intended to be used in cases of emergency, in case the visible signals should get out of order or become ineffective during dense fogs, smoke, etc. It is intended to have recourse to a system of whistles guiding engineers, yardmen and repair men.

We are inclined to think that audible signals may cause confusion where there is more than one engineer expecting to get signals, and that this factor may tend to increase danger to trains rather than eliminate it.

There is one particular time, however, where an audible signal from the signal bridge would be very valuable, and that is when the signal operator notices anyone disobeying signals or approaching real danger. In such case a number of sharp blasts from the signal bridge should quickly call the attention of the erring party to his duty and thus avoid accidents.

Audible signals, unless they can be so given that there can be no doubt as to the party for whom they are meant, are not desirable and may cause the very accidents which they were intended to guard against.—Roadmaster and Foreman.

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A Proper Stop.

A part of a section of a statute enacted by the legislature of a Southern State regarding the duties of engineers as to the ringing of bell and blowing of whistle is: "He must also, on perceiving any obstruction on the track, use all means within his power, known to skillful engineers, such as applying brakes and reversing engine in order to stop the train."

Regarding this, Master Mechanic Henry, Sapulpa, Oklahoma, says: "In reading the last sentence of this section I hope none of our engineers will apply the brakes and reverse engine motion at the same time.

"Emergency application of the brakes and sanding the rails lightly as soon as possible will develop the greatest retardation, inasmuch as the braking power on the driving wheels and the braking power on the tender and car wheels are braked to the limit.

"Hence, reversing the motion of the engine while the driver brake is applied will lock the drivers and cause sliding on account of the back pressure in the steam cylinders, together with the applied brake developing greater power than the adhesion between the wheels and the rails. The sliding causes loss of brake shoe pressure on the wheels, which is a greater retarding power than the pressure between the driving wheel tire and the rail.

"The retarding power developed by back pressure in steam cylinders fluctuates by revolving drivers, at times losing retarding force before locking the drivers, and cannot be depended upon for constant retardation in motion.

"Some years ago I read with interest of a test made of the stopping power of the air brake alone, also in conjunction with the motion of the engine reversed. The result of the test was that by the use of the air brake alone the shortest and most reliable stops were made without skidding the wheels.

"The length of the stop made with the air brakes applied and engine reversed, while being longer, was also damaging to the engine tires, making flat spots three to four inches long on them.

"In the event of failure of the driver brake or air brake on train, reversing the motion of the engine to make stop is the proper course and will not slide the drivers if sand is used.

"Brakes should be tested after each change or separation in train, and a running test made before reaching all dangerous places; apply brakes in ample time, and first reductions should be heavy enough to move pistons by the leakage grooves in brake cylinders which will reduce speed."—The Frisco Man.

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Proposed Regulations for Canadian Railroads.

The Canadian Board of Railway Commissioners at its morning session held October 6, 1908, at which practically all railroads were represented either by officers or counsel, discussed proposed regulations as to trains, cars, engines and employes. These regulations had been sent to all the railroad companies in Canada on September 16th, and at a recent meeting held in Ottawa at which representatives of the Canadian Pacific, Grand Trunk, Canadian Northern, Michigan Central and the New York & Ottawa Railroads were present, they were in the main approved. They provide that:

Every freight car built after December 1 shall be equipped with air brakes and with operating [uncoupling?] levers on both sides of the end.

No freight train shall be allowed to proceed on its journey unless three-quarters of the cars comprising it have air brakes.

The number of cars to a train shall be left to the judgment of officials, but in the case of a double-header the leading engine shall control the train.

Regulations are also made for foot boards, etc., on engines.

On the main lines no light engine shall be run more than 25 miles in one direction without a conductor, in addition to the engineer and fireman. On branch lines the operating officials shall determine the need of conductors on light engines.

Passenger trains shall carry at least one brakeman of not less than one year's experience as brakeman and shall also carry a baggageman, provided that passenger trains of eight or more cars shall have at least one additional brakeman.

Locomotive engineers must have at least one year's continuous experience as a fireman, pass a satisfactory examination as to handling engines, brakes, etc., and undergo an eye and ear test.

Conductors must have one year's experience as brakeman and be 21 years of age.

Telegraph operators must be at least 18 years of age, able to write a legible hand, to send and receive at least twenty words a minute, and to pass an examination upon train rules and the working of telegraph offices.

Every employe must undergo a color (vision) test.

The companies must conform to the rules and regulations of the Master Car Builders' Association governing the loading of heavy materials. No material shall be carried on top of a car.

Crippled cars shall not be allowed behind the van on freight trains. Cars containing live stock or perishable freight when crippled in minor respects shall be chained up ahead of the car and taken to the first terminal for repairs when it is safe to haul such cars. In no case are more than two such cars to be handled in any one train except where the cars have been disabled by a wreck and a special pick-up train has been sent out to bring them in.

A crippled car shall include one with any of the following defects: Broken coupler, disabled coupler, cracked wheel, chipped flange over 2½ inches, broken wheel flange, bent axle or journal, broken arch bar or truck steps.

Railroad companies or their officers, agents or employes, or any of them, disobeying or failing to comply with the provisions of the regulations shall be liable to a penalty of $50 for each offense.

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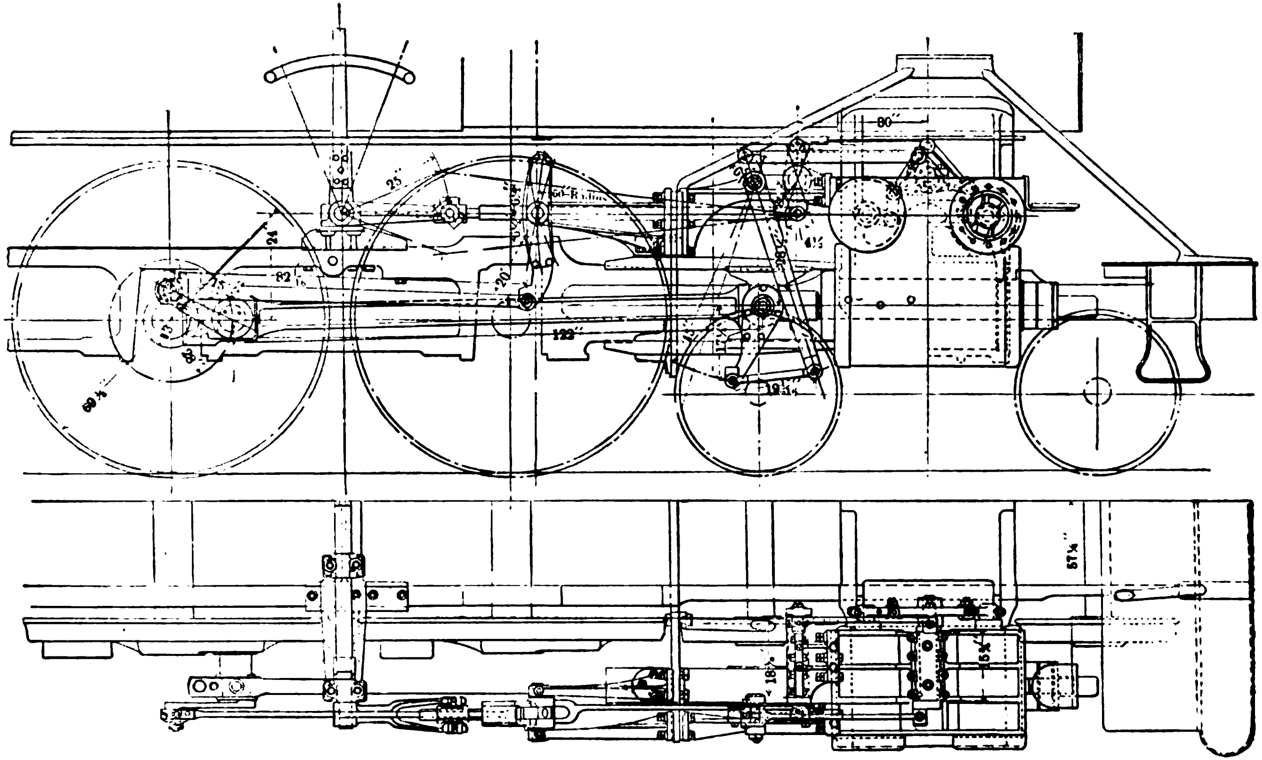
Young Valve and Gear of New Design.

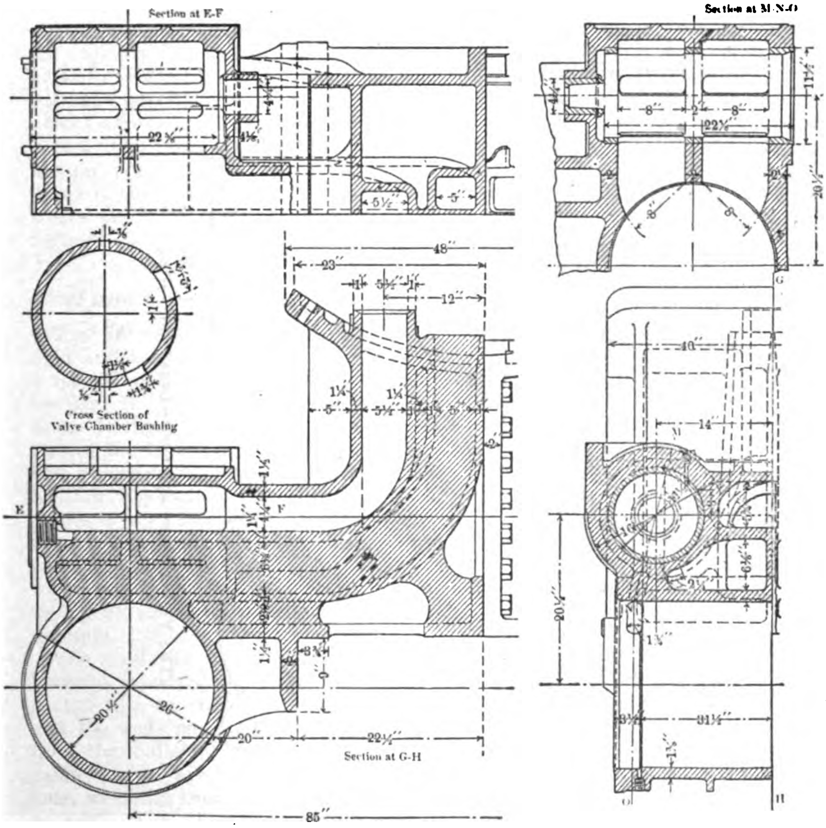
Several locomotives of the Delaware, Lackawanna & Western Railroad have recently been equipped with the Young valve and gear of a new design. The type of valve is the same as that used in former designs of this gear, but new features have been added to the gear itself which in its altered state closely resembles the Walschaert type.

Two rotary valves are employed on each side of the locomotive. These valves are located above the cylinder with their



The Young Valve and Gear of New Design

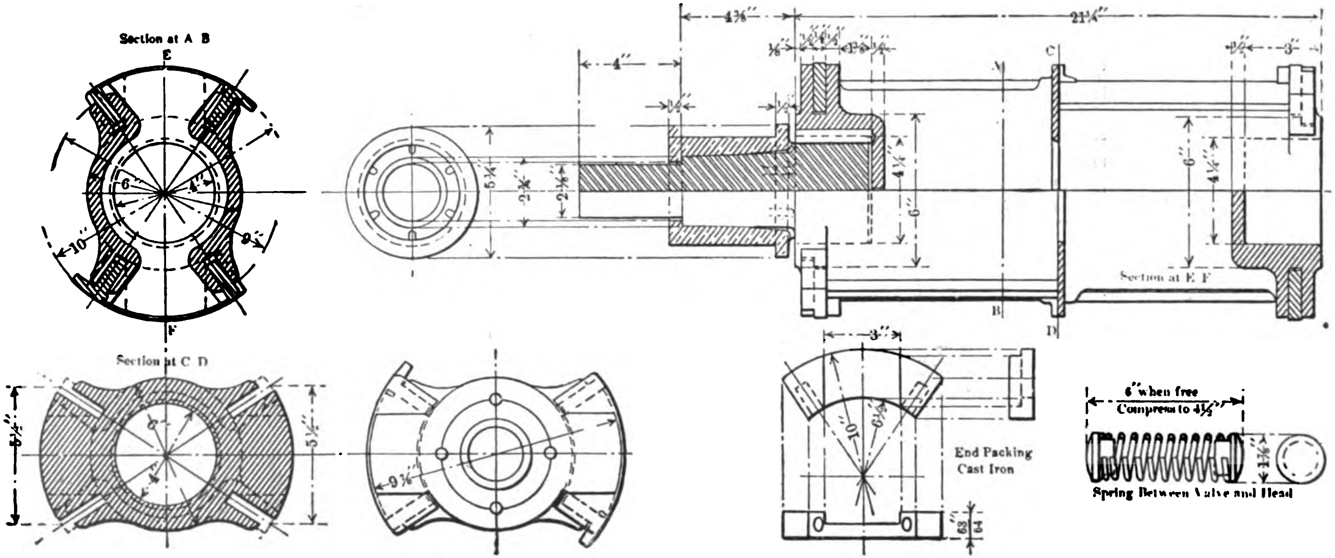
axes at right angles to the axis of the cylinder, and are operated by a wrist plate. Reversing, the point of cut-off and other valve events are controlled in the usual manner by means of a connection to the eccentric or return crank through the medium of the link, which also gives the oscillating motion to the wrist plate operating the valves. The wrist plate has its fulcrum on one end of a bell crank which is operated from a combination lever connected to the crosshead and having a stationary fulcrum. This results in the wrist plate constantly changing the position of its fulcrum at different points of the stroke and alters materially the point of occurrence of the steam events in the cylinder from what is usually obtained with the Stephenson or Walschaert valve gears of ordinary design. This combination of motions is said to give the valves a constant lead for all points of cut-off, at the same time maintaining the early release common to the Stephenson and Walschaert gears, but materially delaying the point of exhaust closure and increasing decidedly the opening of the valve ports during exhaust.



The Young Valve and Gear - Sectional Views of Cylinders and Valve Chambers

The valves and steam passages are so constructed as to give a largely increased port opening. The rapid movement of the valve at the point of cut-off, in connection with the increased port opening referred to, gives a very free admission, permitting the pressure to be held up to the point of cut-off even at very high speeds. The larger port openings for exhaust, particularly at the middle of the stroke when the piston is moving at its highest speed, result in considerable gain in both speed and economy.

The illustrations herewith show clearly



The Young Valve and Gear—Details of Valves the construction of the cylinders and valves, as well as the arrangement of the gear. The valve chambers are cast with the cylinder, with a very short and direct steam port from the bottom of the chamber and a supplementary steam passage from the top of the valve chamber. The valve is made as light as possible, being supported by bearings at either end which practically prevent wear on the bushings.

In appearance this gear is similar to the ordinary Walschaert type, but instead of the combination lever having a shifting fulcrum as in the latter type it has a fixed fulcrum, and the radius bar is connected to a rocker which transposes the motion from the plane of the return crank to the inside of the valve chambers where the wrist plate and bell crank are located.

* * *

Steel and Concrete Ties in Europe.

The use of steel and concrete ties for light and local railways was discussed in a report on track construction presented by Mr. C. De Burlet, of the Belgian Local Railways Company at the convention of the International Union of Street and Interurban Railways, held at Munich in September. Of sixty-nine companies of the class mentioned, forty-seven use wooden ties exclusively, seven use steel ties exclusively, thirteen use both wood and steel (two using steel only at switches) and two use both wood and concrete.

The steel ties in all cases are of the inverted trough section, some having horizontal ribs at the ends of the flanges, and the ends are closed in order to retain the ballast. The ties for meter-gauge tracks are from five to six feet long, weighing from thirty-three to ninety pounds. The ties for standard gauge tracks are from 6½ to 8¼ feet long, weighing from 97 to 115 pounds. The cost of the ties for standard gauge tracks varies from $1.60 to $2.40 (according to their weight and to the condition of the steel market). On all but four of the railways the rails rest directly upon the ties, and are secured by clamps with keys or bolts. The inward inclination of the rails (which is the universal practice in Europe) is obtained by bending the tie.

The results of the steel ties are satisfactory, except on two lines which intend to abandon them. The fastenings are considered to be more reliable and secure than with wooden ties, thus increasing the safety of traffic. The maintenance work upon the track is, as a rule, more difficult, but less frequent attention is required than with wooden ties.

Reinforced concrete ties are used by the Hamburg street railways and the Voiron & St. Beron Railway. The Hamburg lines are of standard gauge. Their concrete ties are 7.2 feet long, weigh 308 pounds and cost $1.50. The concrete is composed of thirty-three per cent. cement and sixty-six per cent. sand or gravel. The reinforcement consists of five ⅝-inch round bars near the top surface. The ties are of rectangular section 6x8 inches, but the rail seats are raised so that the depth is 8.4 inches at these points. This is done to bring the rail to the proper level for the paving. Each rail is held by clamps on a U-bolt which is set diagonally to the tie, and has a bearing plate placed between its horizontal leg and the base of the tie. The ties were laid in 1906, and are considered superior to wooden or metal ties. Their great weight gives them stability, the rail fastenings are more secure and cause less wear, and the ties can be used without any special support or foundation. They are expected to have a much longer life than wooden ties.

The Voiron & St. Beron Railway has had 400 Gilland concrete ties in use since 1903. They have given satisfactory results and promise to have a long life. The line is of meter gauge. The ties are rectangular, 5½x7¼ inches, 6 feet long, with a weight of 230 pounds. They cost $1 each. There are three reinforcing frames, each consisting of a steel bar bent to form an upper and a lower member with diagonal members between them. There is also a coil of wire around each hole for the fastenings, with a metal sleeve or thimble in the top of the hole. At each rail seat there are two tapering holes, each filled solid by a pair of semi-circular wooden wedges driven in from the bottom. The screw spikes are driven into these, the mushroom heads of the spikes bearing upon the rail base.—Engineering News.

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Rail Limits and Heavy Locomotives.

In the effort to move traffic economically, large train units have resulted, so that the weights of equipment, especially engines, have been somewhat in excess of what track was designed to bear. In other words, it has usually been the custom to build large engines first and then probably increase the stability of track so as to sustain them. This is putting the cart before the horse, and is expensive in many ways. The exception is usually in bridge work. Timber structures are ordinarily designed with so large a factor of safety as to carry any load that can run on rails, and steel structures are carefully watched so as to prevent overload. Not so with rail, however. If a track laid with 80-pound rail stands up under a wheel load of 20,000 pounds, it is usually soon called on to sustain a load of 25,000 pounds, and when the rail begins to fail the manufacturer is blamed. Eventually a heavier weight of rail is used, and while the number of breakages may be reduced, the wear from abrasion continues. Inasmuch as the area of contact between wheel and rail is practically the same for a 12,000-pound wheel weight on a 60-pound rail as it is for a 30,000-pound weight on a 100-pound rail, it follows that with the same grade of rail the wear of the 100-pound rail is much faster than the lighter 60-pound rail. In other words, while it is possible to manufacture a rail stiff enough to sustain, without breakage, a wheel load of 30,000 pounds, such a rail, if of ordinary Bessemer steel, will wear away rapidly under the abrading effect of the heavy driver load. This limit seems to have been reached much below the 30,000-pound weight of some recent engines. It would seem to be probably even lower than 20,000 pounds per driver. The result is that some changes in the whole scheme of rails and wheel loads would seem to be in order.

A well-known formula states that each ten pounds per yard of weight of rail, properly supported by cross-ties, is capable of supporting a safe load per wheel of 2,240 pounds. Applying this approximate rule, it will be found that an 80-pound rail can carry a wheel load of about 18,000 pounds, and one of 100 pounds a weight per wheel of 22,400 pounds. As a matter of practice, the 80-pound rail is frequently called on to sustain as much as 22,500 pounds, and the 100-pound rail 25,000 and even 30,000 pounds per wheel. On this basis and from practice it would seem that to properly support the maximum wheel loads of 30,000 pounds, rails of 125-pound weight per yard would be needed. While this is heavier than any in service in this country, their manufacture is not impossible, nor is the cost per mile prohibitory for the larger lines.

But while these heavier rails will solve the immediate question of breakage due to too small a section, their use does not increase the area of contact between wheel and rail, and so does not prevent the abrasive destruction of the rail. To prevent this calls for a higher grade of metal in both tire and rail, and this requires some increase in the cost of same. An attempt has been made to improve the wearing qualities of rail by rolling them at a lower temperature, but the result has been a brittle rail. So that the choice at present is between a soft, fast-wearing rail and a hard, breakable one. Obviously, safety prevents the use of the hard one.

The alternative seems to be in the lightening of the wheel loads. It is a matter of serious doubt whether the rush for heavy power has been for the best. It is partly due to the desire for maximum train loads, and in many cases the economies have been doubtful. Certain it is that operating ratios are still very high, while fixed charges have been increased. Just how much has resulted from the rivalry of roads in the matter of largest engines is an interesting question. Then, too, the increased train-load could have been attained by some judicious changes in grades, using the same rail, engines and bridges. In any case the limit of wearing quality of rails seems to have been reached, and in some cases exceeded, with the present grades of metal. This, too, when the weights of engines could have been reduced without lessening their power. With the usual heavy consolidation type of freight engine it is possible to limit the weight per driver to 20,000 pounds and still have adhesion enough from a ratio of 4.5 of weight on drivers to tractive effort. The principal examples of excessive wheel loading seem to be in the Atlantic and Pacific types. In the case of the Atlantic type the excessive wheel loads seem to have been caused by an effort to get weight enough on four drivers to balance a tractive force usually found in the six-driver, ten-wheel type. Its successor, the Pacific type, with six drivers, solved this problem temporarily, until designers went to extremes in the large engine styles. As an excuse for this may be offered the fact that heretofore the problem has been to get enough weight on the drivers to prevent slipping, and former designs have rarely provided sufficient weight for this purpose. In other words, engines have usually been "over-cylindered." To err on the other extreme and at the same time load the rail beyond the limit of wear of surface would seem to be bad practice. As an illustration, a recent design of Pacific type of engine for fast passenger service develops a tractive effort of about 33,000 pounds, with a weight on drivers of 176,000 pounds. This gives a tractive ratio of 5¼, where a ratio of 4½ would serve. On this latter basis the weight on the drivers would be under 150,000 pounds, or 25,000 pounds per wheel, as against nearly 30,000 pounds. The difference of 5,000 pounds per wheel represents unnecessary weight that is especially destructive in an engine in fast passenger service. It is possible by the use of better grades of steel to get the same strength with the reduced weight that would still take care of the tractive effort.

The above illustration shows the extreme to which the loading of rails has been carried. The solution calls for either a reduction in weight per wheel or an increase in weight of rail together with an improvement in the metal used. —The Railroad Herald.

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*Western Railroad Activities.**

Will Greatly Augment Equipment.—The Denver & Rio Grande Railway has authorized the expenditure of a sum aggregating about $12,000,000 for the enlargement of its terminal facilities in Denver, Pueblo, Salida, Grand Junction and Salt Lake City, and for the purchase of additional equipment.

The assigned reason is the expectancy of a vast increase in business in the immediate future, and a preparation of the business which will result to the Rio Grande lines upon the completion of the Western Pacific Railroad from San Francisco to Salt Lake City, where it will connect with the Rio Grande. The Western Pacific is being built by the Rio Grande and will be an associated line.

In Denver alone additional freight houses will be built and the shops enlarged, this work calling for the expenditure of some $5,000,000. At Pueblo the shops will be enlarged so as to accommodate the work of the Missouri Pacific System, which is an affiliated road, and additional freight houses will be built.

Twenty-eight new and powerful (latest type) locomotives and $1,000,000 worth of new steel freight cars have also been ordered in anticipation of very heavy business in the very near future. This new equipment will be delivered as soon as possible.

Work on Surveys to Soon Begin.—C. W. Cooper, assistant general passenger agent of the Canadian Northern Railway, recently visited San Francisco on business connected with his line. Speaking of railway matters in his territory Mr. Cooper said: "Our company has constructed more than 350 miles of new line in 1908, and we have made about 3,000 miles of extension surveys altogether.

"Active construction work will be commenced on some of these extensions early in the spring of 1909. All the roads in Canada are now being taxed to their utmost capacity to handle the enormous wheat crops, which are estimated at 125,000,000 bushels for 1908. This is in every respect the greatest crop ever produced in the Dominion."

Improving the N. W. P. Line.—Though no actual new construction has been undertaken on the Northwestern Pacific for the past year, considerable expense has been incurred in improving the main line by laying heavy rail and in reballasting the track so as to keep it up in the condition which is demanded by Mr. Harriman of all the properties in which he is interested. One of the contemplated improvements is the building of a bridge across the Russian river at Monte Rio, and then standardizing the line from Monte Rio to Cazedaro, the road from Monte Rio southward to remain narrow gauge. It was expected that the work of building the cut-off from Corte Madera to Greenbrae would be finished before January 1, 1909.

On the main line new rails have been laid between Cloverdale and Ukiah, and that stretch of road is now being reballasted.

Working on a Big Bore.—It was expected that by November 30th last the headings in the Spring Garden tunnel of the Western Pacific Railway between the watersheds of the North Fork and Middle Fork river, ten miles east of Quincy, would meet, completing the 7,000-foot bore through the backbone of the mountains.

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*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

There will be considerable bench work to do for steam shovels after the headings break through before trains can be operated in the great tunnel, but it is conceded that the tunnel will be ready for use long before the construction work between the tunnel and Oroville is completed.

Mr. Harriman has Acquired Control.—Well authenticated reports have reached San Francisco from the City of Mexico that E. S. Cravath of New York, who is President Harriman's agent in the Mexican capital, the "Little Wizard" has acquired a controlling interest in the United Railways of Yucatan; also that the first payment of $7,000,000 has already been made.

This system radiates from Merida, Mexico. The statement is also made that Mr. Harriman now owns the Pan-American, which extends from a point on the National Tehuantepec line to the Guatemalan border, and that the two systems are to be connected by the building of about 400 miles of new road.

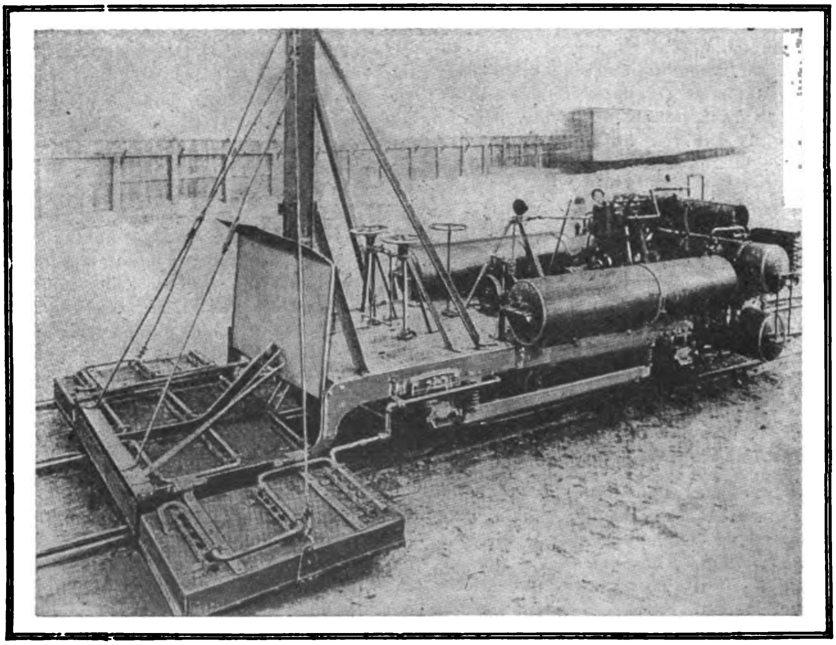
Union Pacific's Weed Burner.—The problem of keeping the right of way on railroad lines free from weeds during the spring and summer months has always been a difficult one with the operating officials. This has been specially true with the Union Pacific lines.

They have proved to be a very expensive annoyance to that company, so much so, that it was found to be absolutely necessary to devise some plan to get rid of the "weed problem."

More than a year ago the operating officials of the Union Pacific set about to produce some means of handling this work at a minimum cost. Many suggestions were made, including cutting the weeds by machinery, and sprinkling the way with a saturated solution of salt and water, which would tend to kill off the weeds. But after many experiments in the way of machines for this work, the idea of a gasoline weed burner was conceived by A. L. Mohler, vice-president and general manager.

This idea has been fully developed at the shops of that company at Omaha, which is doing the work very rapidly and effectively, and at a greatly reduced cost.

The "weed burner," as designed, con-



THE UNION PACIFIC COMPANY'S WEED BURNER

sists of a four-wheel car entirely of steel, with regulation standard wheels, boxes, axles, pedestals, etc. At one end of the car is a gasoline engine mounted on the floor, which is used in propelling the car and pumping air, the air being used to force gasoline to the burners, and to elevate the side wings. The propelling mechanism is designed with two speeds—slow speed used while burning weeds, at three to four miles per hour, and the high speed used in going to and from the work—at from 12 to 15 miles per hour.

Attached to this car are a number of tanks carrying the supply of gasoline sufficient for the day's run on the road. This gasoline is forced into a system of burners carried on the back of the car, making a very hot flame close to the ground, which practically kills the weeds, while, by cutting them off, the growth is in no way stopped. At the rear of the car, carried close to the ground, is a framework carrying the piping, to which are secured a number of burners placed in rows across the track.

The framework is divided into three sections; the center section extending a little beyond the rails, and the side sections being hinged to the center section, in order that they may be lifted out of the way of obstructions outside of the track, and to clear cattle guards along the right of way. They can also be set at an elevation in order to get the burners close to the ground on any kind of grading. With these sections in operation a strip 12 feet wide is burned, or three and one-half feet on each side of the rails.

It has been found advisable to make a first burning early in the year, when the growth has reached from six to eight inches in height; then going over it again a few weeks later, when it has dried somewhat, and this time the weeds are entirely destroyed—root and branch. It is sometimes necessary to repeat this performance three months later.

The machine is capable of burning from 20 to 25 miles a day—running from 3 to 4 miles per hour. Three men all told are required to handle the car, which is handled on the road under orders, as a regular train. When the weeds are cut by hand it requires approximately 16 men to cut one mile of track per day, hence the machine does the equivalent work of about 300 men. The solution of this difficult railroad problem was, after all, a very simple matter. The gasoline weed burner is in reality an automobile mounted on railroad car wheels, and equipped with the weed-burning apparatus.

An Excellent Roadbed.—Stockton, Cal., was recently visited by a prominent party of railroad men of national reputation. In the party which traveled over the lines of the Western Pacific, were E. B. Boyd, vice-president of the Denver & Rio Grande, with headquarters in Chicago; W. J. Shotwell, general agent of the same system on the Pacific Coast, with headquarters in San Francisco, and John Wilson, division engineer.

General Agent Shotwell reported an excellent roadbed between Oakland and Stockton, and said the overland trains would be operated through Stockton early next summer. A large union depot also is to be soon constructed at Stockton. Contracts have been let for the building of a number of depots along the line. A big roundhouse and turntable is now in progress of construction at Stockton.

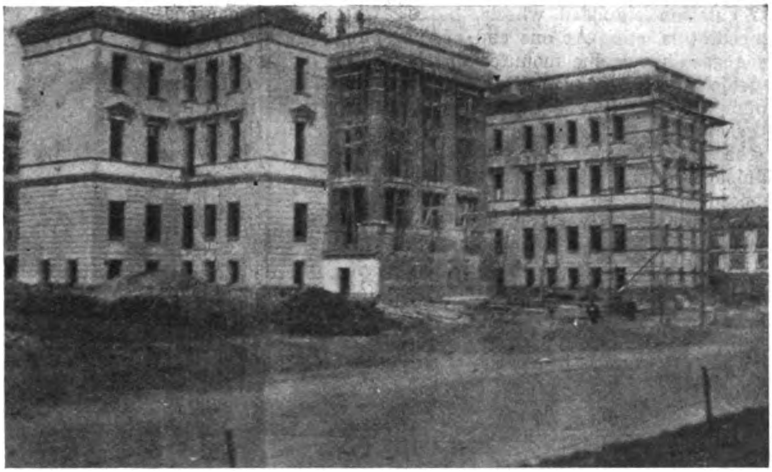
At the Big Flower Lake Tunnel.—Engineers of the Western Pacific have announced that the headings were through in the Big Flower Lake tunnel in Utah, and that all the lines were very correct, there not being the slightest "jog" at the meeting point. This is one of the main tunnels on the new Gould line, and is 5,664 feet long.

The Division Almost Completed.—Advices received from Mexico are to the effect that the Chihuahua and Torreon divisions of the Mexican Central are nearly completed. New rails are being laid on both divisions and 12,000 tons of 75-pound rails are being put down in place of the old 56-pound rails. Before the laying of this lot of 12,000 tons of rail a shipment of 25,000 tons of heavier had been laid.

Building an Immense Drawbridge.—The great bridge that is to span the southern arm of San Francisco Bay on the Southern Pacific's Dumbarton Cut-off, is nearing completion. Including the approaches, the bridge will be nearly 1½ miles long.

About the center there is now being constructed an immense steel drawbridge with a single span about 320 feet in length. It will swing on a central pier, the opening on each side of the pier being 125 feet in the clear.

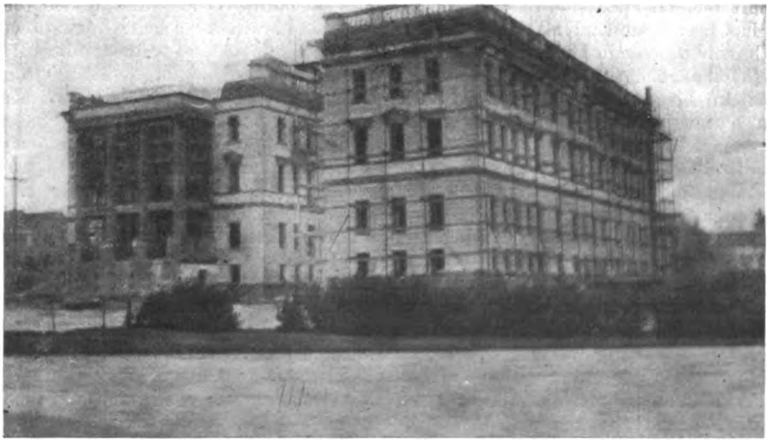
This pier will be 40 feet in diameter, and is being built in the form of a mighty steel cylinder filled with concrete. Chief Engineer William Hood, of



VIEW OF NEW SOUTHERN PACIFIC COMPANY'S HOSPITAL DURING CONSTRUCTION, FROM THE SOUTHWEST

the Southern Pacific, has charge of the building of this great pier, and he says that the construction of this pier is one of the most difficult jobs of engineering ever undertaken in the West. The tidal currents are very strong at that point, and the depth of the water, even at low tide, is about 55 feet.

The S. P.'s Splendid New Hospital.—Work on the Southern Pacific's new and splendid hospital in San Francisco is being crowded forward rapidly, and will be ready for occupancy early in the coming year. This will be the largest and most costly railroad hospital west of the Missouri, costing about $275,000 when finished, furnished and properly equipped. Several hundred patients can be very comfortably accommodated at one time. This splendid building will be up-to-date



VIEW OF NEW SOUTHERN PACIFIC COMPANY'S HOSPITAL DURING CONSTRUCTION, FROM THE SOUTHEAST

in every respect—fully equipped with every modern surgical appliance, etc.

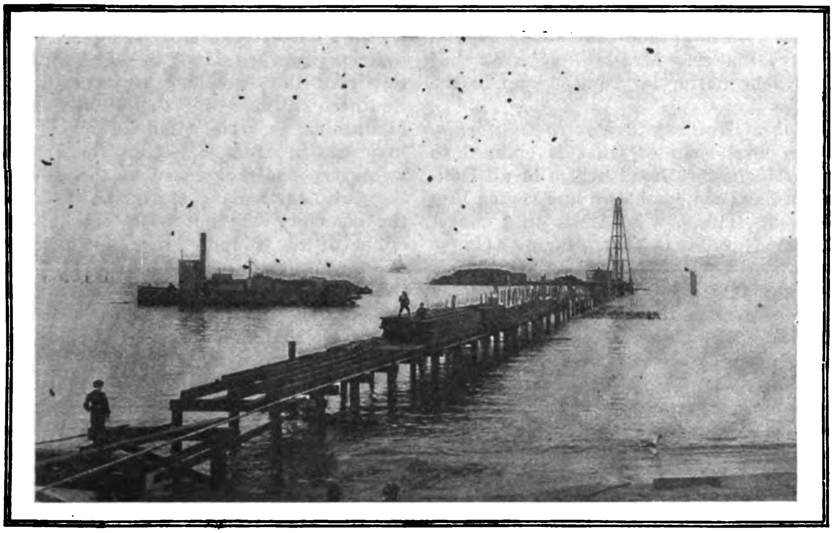
No hospital in the country will have better arrangements for perfect sanitation, and every patient will have the best care and treatment at the hands of a staff of very skillful and experienced medical and surgical practitioners.

This new hospital will take the place of the old and much smaller building that was destroyed by the great disaster of April, 1906.

Working on the Grade.—At present 600 men and 150 teams are working on the grade of the Ocean Shore line. There are only about 13 miles yet to grade before the entire line of road—84 miles—will be completed between San Francisco and Santa Cruz. Two additional engines were recently shipped from the Baldwin Locomotive Works and were expected to reach San Francisco early in December.

Work On Great Dock Railroad, Etc.—Active operations have been commenced by the U. S. Government near Fort Mason, San Francisco, for the construction of an immense dock pier and railway tracks. This work has been awarded to the California Bridge Construction Company of San Francisco. The total cost of these great improvements will reach about $2,000,000, of which amount Congress has alrealy appropriated $1,500,000, and that sum is now available.

In addition to building a great steel and concrete pier, over 1,500 feet long, by the government, the Southern Pacific Railroad Company will do a great deal of expensive work. That company will construct a line more than a mile long, extending close to the water front, to Fort Mason, and thence out to the terminus of the great pier. In order to reach the inner end of the dock at the shore it will be necessary to cut a tunnel over 1,500 feet long through the military reservation at Fort Mason. Permission to do this has already been granted by the War Department. Other expensive work will also be done by the railway company.



WORK ON GREAT DOCK, RAILROAD, ETC.

Showing initial work recently commenced by the California Bridge Company for the U. S. Government, and to cost about $2,000,000

This pier will be of ample dimensions to allow five huge government transports to dock alongside at one time. Several very large warehouses will also be built on the shore through which the railroad lines will run.

The contract calls for the completion of this great work within 18 months.

Mr. Hill Says, "Its Up to the City."—Mr. Jim Hill recently announced at Tacoma, Wash., that the Great Northern has for a long time desired to enter that city as speedily as possible. It will come from Seattle over the Northern Pacific's double track. First, the latter road must provide a modern passenger station to replace the present frame depot built over twenty years ago. The Great Northern will build its own yards, warehouses, and other freight terminals on land purchased from the Northern Pacific over fifteen months ago.

The Tacoma Chamber of Commerce, commercial organizations and real estate associations have all jointly worked in vain to secure the co-operation of the Tacoma city council, or to overcome its opposition to allowing Mr. Hill's railroads an opportunity to create modern terminals costing over $6,000,000, including a new water grade entrance around Point Defiance. Mr. Hill declares that the whole matter is "squarely up to the city."

Highest Railway Bridge in California.—The final span of what is claimed to be the highest railroad bridge in all California has been completed and swung into position. This new bridge is on a cut-off of the Nevada County Narrow Gauge Railway, of which Mrs. S. A. Kidder is the president, and its completion early in December last will work the opening of a new cut-off on that road that has been under construction for several months.

The bridge spans Bear River in Nevada County, between Grass Valley and Colfax, and the track stands just 200 feet above the surface of the water, even at a high stage. The bridge is 800 feet long, and is constructed of steel. The total cost will reach $75,000, and this expense has been met for the purpose of shortening the road two miles and saving 15 minutes in running time. This new bridge takes the place of a much lower wooden structure that has seen service for years. [Note.—The total length of the N. C. N. G. R. R. is about 25 miles. It was constructed some years ago by Nevada County local capitalists, but the principal builder and owner of the line was S. A. Kidder. The latter died about six years ago and ever since his widow, Mrs. S. A. Kidder, has been president and general manager of the company. She looks after the actual operation of the road and the general business affairs, etc. She is a woman of rare executive abilities, and it is claimed that she is the *only woman* railroad president in the world.]

Work on the Rawhide Western Railway.—The good news has reached Reno, Nevada, that all arrangements have been completed with a New York syndicate that will insure the very early finishing of the Rawhide Western Railway from Schurz over into the great mining camp of Rawhide. The total length of the projected line will be about 28 miles. Work on the line was commenced recently. For some time negotiations have been pending between the Rawhide Western Railway Company and eastern capitalists for ample funds with which to finance the project. Now that the deal has been consummated, and ample capital assured to complete the grade and equip the line, work will be crowded forward with all possible haste to an early completion.

Repairing Two Tunnels.—The work of repairing the two long tunnels of the Southern Pacific in the Santa Cruz Mountains, at Wright and Laurel, is still in active progress. Both of these bores were very badly damaged at the time of the great earthquake of April, 1906, and the company has not been able to use either of the tunnels since the disaster, so great was the damage wrought. The tunnels have very recently been carefully inspected by Southern Pacific engineers, who state that the work will not be fully completed before May 1, 1909. Considerable other work is being done on this same line in the way of elimination of curves and improving gradients.

Relaid With Heavier Rails.—The Santa Rosa branch of the Southern Pacific from Pajaro down to Santa Cruz, on Monterey Bay, is now being relaid with 76-pound steel rails. On account of light rails and heavy trains, considerable time has been lost each trip. The work of relaying is rapidly nearing completion.

Coal For Motive Power.—President Harriman is credited with the recent purchase of 5,000 acres of oil land in Mexico, located below Tampico, and adjoining Tuxpan. He is said to have paid $50 gold per acre. There has been considerable activity lately in the Mexican oil fields, and it is asserted that Mr. Harriman's purchases are for the purpose of providing oil for his motive power in that republic.

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South Manchuria Railway.

Consul Roger S. Greene, of Dalny, in Daily Consular and Trade Reports, gives the following information concerning the standardizing of the South Manchuria Railway and the introduction of American rolling stock thereon, with the benefits which are expected to result:

As previously reported, it was decided to defer using the standard gauge material on the South Manchuria Railway until the whole line was standardized. This work was finished in May, and during the five days from the 22d to the 26th the new American rolling stock was substituted for the old along the whole line, beginning from the north. The service is now being regularly maintained, on a slightly altered schedule, with the new material. The change was effected without interrupting the passenger service, and it was only necessary to suspend through freight shipments for about a fortnight, which was done without great inconvenience, as the busy freight season is now practically over. The old rolling stock will gradually be returned to the Japanese railways from which it was taken during the war.

The new equipment set up, tested, and ready for service at the time the change was effected was as follows: Locomotives, 121; combination first and second class passenger cars, 10; second-class passenger cars, 44; third-class passenger cars (temporary), 10; mail and baggage cars, 15; box cars, 453; gondola cars, 650; flat cars, 197; cabooses, 100; water tank cars, 3.

There will be no regular first-class passenger cars until the end of the summer, and possibly no sleeping cars till well into the fall, but a temporary first-class has been arranged with chairs, which is attached to the one through train that is now run each day, leaving Dalny at 7 in the evening and Kwanchengtzu at 7:55 in the morning. The new second class really corresponds to the old third class, and the new third class to the old fourth class, consisting of box cars without seats for the coolie traffic, the fares remaining approximately the same for short distances. For long distances fares have been raised slightly, as they are now based on fixed rates per mile, whereas formerly the long journeys were made relatively cheaper. The passenger mileage rates are as follows, per mile: First class, 6.075 sen (3.025 cents); second class, 2.7 sen (1.345 cents); third class, 1.8 sen (.896 cent).

Already it is found that great economy will result from the broader gauge, and accordingly a new freight tariff is shortly to be issued which is expected to do much to encourage trade.

The time remains practically unchanged, and it is not expected that any faster trains will be run before next year. Much better connections than before are now made with the steamers running between here and Japan, and the railway company is, moreover, negotiating with the Nippon Yusen Kaisha for the opening of a weekly service between this port and Shanghai with a first-class passenger steamer.

This may not only help to attract the European passenger traffic to this route, by offering a reduction in time of more than two days, compared with the Vladivostok route, but, what is far more important, it may encourage Chinese and foreign trade by affording regular and prompt freight connections with that important depot. Hitherto steamers have come from Shanghai only very irregularly, as the volume of business has not been sufficient to make a regular service attractive to unaided private enterprise.

If Dalny is made the most convenient port of entry for Manchuria, as such connections will help to make it, a solid foundation for future growth will have been laid, and buyers and sellers will come here in greater numbers. [Copies of timetable and fare schedules of the Manchuria Southern Railway, and a chart of Darien Wan, Kwanktung Peninsula, are on file in the Bureau of Manufactures.]

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*The British Locomotive.**

The student of the locomotive, in learning the lessons to be learned from the world's locomotives, will probably be struck by the apparent conservatism and backwardness of British practice. The locomotive of today is but an enlarged edition of that of fifty years ago. Compounding is in its infancy, while on very few lines is any attempt being made to reduce the fuel bill by the introduction of other economical systems. But it must not be thought that the attitude adopted by British engineers is a wrong one. The whole question of locomotive design is one of surroundings. Just as locality rules the general arrangements of any particular engine, so locality defines the broad principles of design. British principles are just as suitable to British surroundings as American or continental ideas are suitable to those localities, and there is absolutely no basis upon which to rest an assumption that because a certain type is successful on the continent, it must, *ipso facto*, be successful in England.

The earliest form of British locomotive was the single driving-wheel type. With increasing loads, however, the tractive force of this type was insufficient, and the 4-coupled engine, with a fixed leading axle, was introduced. As the engines grew larger, the fixed axle was replaced by a leading bogie, which form the standard British locomotive now takes. On heavy roads the 4-coupled engine is replaced by a 6-coupled type, by which means the tractive force is again increased. Many engineers favor the Atlantic type, in which a fixed axle carries the foot-plate, all 4-coupled axles being in front of the firebox. This enables a larger firebox to be secured, but as there is no increment in weight available for adhesion, it is doubtful if this class has an advantage over the 4-coupled, 8-wheeled type. Goods engines are usually of the 6-coupled type, while for mineral traffic 8-coupled engines are employed. Tank engines are of various types, but are usually built from standard parts.

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*From a paper read before the Rugby Engineering Society by A. W. S. Graeme.—Reproduced from Railroad Age Gazette.

Frames are of mild steel, 1-inch or 1⅛-inch thick. On the London & North-Western, to avoid great lengths of frame, each is composed of two plates bolted together. The front pieces are inside the main frame, thus allowing more side play in the bogie wheels.

Frame stays, other than cylinders and draw-box castings, are of cast steel, and are riveted to the frames.

Cylinders are of close-grained cast iron, and are arranged between the frames or outside the frames. Inside cylinders are invariably cast in one. Outside cylinders are occasionally cast in one, with a saddle supporting the smokebox. There is considerable divergence of opinion as to the correct position of cylinders. Inside cylinders require a cranked driving axle. The uncertainty of crank axles has led many engineers to adopt outside cylinders. Outside cylinders have the disadvantage of requiring larger balance weights in the wheels; cause increased condensation; while the methods of securing them are unsatisfactory. They are bolted on through large flanges. As there can only be one flange available for bolting, the movement of the pistons will in time cause the bolts, originally driven in tight, to work, and the cylinder to become loose, causing breakage of steam pipes and steam-pipe joints. Thus an outside cylinder will give trouble sooner than an inside cylinder. With outside cylinders cast in one, this trouble is largely obviated, but on the whole inside cylinders are more reliable, especially in conjunction with the built-up crank axles. Cylinders are from 17 inches to 20 inches in diameter, the usual stroke being 26 inches.

Piston heads are of cast steel, and are provided with two cast-iron rings.

There is a decided preference for the ordinary slide valve, some method of balancing being provided. This frequently takes the form of a rectangular frame let into grooves at the back of the valve. It is spring supported against a flat machined surface at the top of the steam chest. On the Great Northern the back of the valve is cut out, and the exhaust steam passes through direct to the blast pipe. Slide valves are usually of brass or gun metal, sometimes of cast iron.

Piston valves are not greatly favored. They have the disadvantage that the size of the cylinders does not warrant the large diameter of valve that is required if satisfaction is to be given. With piston valves under 9 inches diameter, it is a difficult matter to get sufficient spring in the rings, which leads to the valves being driven in very tight, causing excessive friction and steam consumption. On the other hand, piston valves over 9 inches diameter introduce unnecessarily large steam ports, as well as increased condensation. Where piston valves have been adopted external admission is the rule, partly on account of simplicity of valve gear, and partly because of the more direct exhaust obtainable.

The standard valve gear is the link motion or Stephenson's valve gear. On the London & North-Western and the Lancashire & Yorkshire, Jov's gear has been adopted. Walschaerts gear has been tried by a few engineers. There is no need to discuss the theoretical advantages of these radial or semi-radial gears.

In the link motion, the motion of the valve is harmonic, and consequently the stresses in the rods are of a steady nature throughout the travel. In radial motions, the object of which are to obtain sharp admission and cut off, the travel of the valve is jerky, causing uneven stresses on the motion rods and pins. This results in greater wear and tear on these parts. Again, the area swept out by the links and rods in Stephenson's gear is quite minute compared to that of a radial motion. The greater the area swept out in one revolution the greater the wear on the parts concerned.

As regards the improvement in steam distribution, it is a question whether at high speeds there is any more wire drawing with a link motion than with a radial motion. The advantages of a constant lead are dubious. In a link motion with open rods the lead gradually increases as the gear is linked up, and all functions of the valve occur earlier. This leads to an earlier exhaust, a matter of great moment for high speeds.

Joy's gear has, however, one great advantage which recommends it above all others for locomotive work. It eliminates eccentrics, and hence it is possible to give an additional bearing at the center of the axle. This is provided by a center-bearing casting bolted at one end to the motion plate, and at the other to a frame stay at the back of the axle. This casting contains a brass bearing, spring floated. It is not so much a bearing in the ordinary sense of the word as a stay against the bending stresses set up in the axle. Not only does the center bearing prolong the life of the axle, but it also reduces the side wear in the axle boxes, thus making it possible to obtain a larger mileage before "knocking" sets up.

Axles are of an alloy of steel, and are rough forged under the hammer. Both nickel and chrome steel are in use on the London & North-Western.

Crank axles are made of the same steel alloys. At Crewe they are forged under the hydraulic press, both cranks in the same plane. The final operation is to twist the cranks until they are at 90 degrees to one another. A very liberal allowance is made for machining. The forging is at the best a complicated one. The effect of twisting the forging is unknown, and there is always the possibility of hidden flaws. It is on account of this, and the practically unknown stresses to which the axle is subjected, that has led many engineers to adopt outside cylinders. The other and better alternative is the built-up crank axle. This was first introduced into locomotive practice by the late F. W. Webb, whose 4-cylinder compounds were provided with these axles in 1900. So successful have they been that Mr. Whale has continued to use them in his simple passenger and goods engines. The axle is in nine pieces, each a plain forging. The crank webs are shrunk on and keyed to the journal and crank-pin pieces. The webs are nearly symmetrical in shape, the journal pieces being inserted at the center. The portions of the web opposite the crank pin are of such a weight as to provide an accurate dynamic balance to the revolving masses of its connecting rod and "bog end." D. Drummond, of the London & South-Western, has also adopted built-up crank axles. Plain forged crank axles are often strengthened by hoops shrunk on the webs.

Slide Bars.—The arrangement of slide bars varies, single, double, and four bars being in use. They are usually carried by a cast-steel motion plate at one end and by the stuffing-box at the other. In some cases the motion plate only carries the bars at the center. Besides being more mechanically correct, this method has the advantage of leaving the piston glands easily accessible.

Connecting Rods.—These are steel forgings. With one or four bars, the little end is a plain brass-bushed eye, and forked, with strapped eyes secured by cotters, when two bars are used. Big ends vary in design, the ordinary strapped type being very common. These are heavy and expensive. The ordinary form of marine big end is now finding favor, as it is probably the cheapest, both in first cost and up-keep. For outside cylinders the late F. W. Webb designed a solid big end fitted with a taper block at the back of the brasses to take up wear. Mr. Churchward, of the Great Western, has introduced in his outside-cylindered engines a plain bushed big end without means of adjustment.

Wheels are now of cast steel for passenger engines. Cast iron is sometimes used for the coupled wheels of goods engines. Tires are of a medium steel, about three inches thick, shrunk on. A lip is provided to engage in a recess in the wheel, to prevent side movement.

Horn plates are of cast steel, bolted to the frames. Adjustable horns are sometimes provided for driving, and coupled wheels, to minimize the boxes "knocking" in the horns. The rearmost plate does not engage with the box, but slopes away, a taper block with screw adjustment being provided between the horn plate and the box. Since most of the "knock" is developed in the box itself, by the bearing wearing oval, this seems to be an unnecessary complication, and has the objection that the taper horn is difficult to adjust properly, and there is, consequently, the danger of the box sticking in the horns.

Axle boxes for driving and trailing coupled wheels are of cast steel with a brass bearing forced in hydraulically, and further secured by brass plugs driven in from the top of the box. The actual bearing provided is less than half the circumference of the journal. Boxes for bogie and carrying wheels are of brass, with a white-metal crown bearing about four inches wide. Some engineers provide movable steps or bearings to driving and coupled wheels, with the object of avoiding the lifting of the engine when dealing with a hot box. This plan has the disadvantages that the fitter is unable to get a good bearing, and also that there must be a certain amount of initial "knock."

To obtain a flexible wheel base the front end of the locomotive is carried on a truck. This is composed of two pairs of wheels carrying a separate framing. This truck is only connected to the engine by a center pin, about which the bogie can swing, the weight being carried by a flat-surfaced casting bolted to the truck frames. As the front wheels require more play than the trailing, the truck is given a certain amount of side play, generally about ⅞-inch either side. This movement is spring controlled. Trucks on this principle are inclined to oscillate when running at high speeds. To overcome this the late Mr. Webb replaced the flat bearing surface by curved guides, in which the center casting carrying the weight was free to slide, subject to the play of the controlling springs. By this means the leading wheels obtain the extra play required, while the curved guides prevent oscillation.

Springs for driving and coupled wheels are usually of the coiled type, laminated springs being provided for bogie and carrying wheels. In some cases the springs for delivery and coupled wheels are connected by equalizing levers pivoted at the center. This reduces spring wear and promotes easy riding on bad roads, but it is of little advantage where the permanent way is good.

Coupling rods are plain steel forgings, of fluted section to reduce weight. The eyes are bushed, and no means of adjustment provided.

Footplate Castings.—The footplate of a tender engine is carried on a heavy casting, in which the draw gear is situated. The weight of the casting depends largely on the weight of the cylinders, as it is required to balance the front end of the engine, so that the center of gravity of the whole is brought into the required position in the neighborhood of the driving axle. Tank engines require no footplate casting, as the tanks and bunker balance the cylinder casting.

It is in the design of the boiler that the greatest variation in British practice is seen. It is now universally recognized that the power and capabilities of an engine depend entirely on the boiler. This is seen in the great advance in boiler power that has taken place recently, the cylinder dimensions remaining the same. Theoretically the formula 3.3 d^2 will give in square feet the requisite heating surface for a cylinder diameter d. Thus, for an engine with 19-inch cylinders, 1,191.3 square feet would be enough. In Mr. Whale's "Precursor" class, now the standard express locomotive of the London & North-Western, 1,989 square feet is supplied for this diameter of cylinder, while on a recent engine built for the North British no less than 2,500 square feet is allowed to supply steam to cylinders 18½ inches in diameter. The boiler for the "Precursor" class is 5 feet 2 inches diameter over the largest ring. There are three rings, lap riveted. This diameter of boiler enables the copper box to be much wider at the top than at the bottom. In ordinary boilers of this size this fact necessitates the firebox covering plate being in three parts, so that the copper box can be inserted from the top. In this particular boiler, however, the steel covering plate is in one, the copper box and foundation ring being inserted from the back before the back plate is riveted in position. To enable this to be done the back plate is flanged externally, the rivet heads being thus on the outside and easily accessible for hydraulic riveting. There is no firehole ring, the copper being flanged outward to suit a similar flange in the steel plate. All rivet and stay holes are drilled. The water spaces are 3 inches wide on the foundation ring. The copper box is stayed with copper stays, 1 inch and 1⅛ inches diameter. The roof is stayed from roofing bars slung from the covering plate. The top of the back plate is stayed by gussets. There are no longitudinal stays between tube plates. The tubes are of copper, 1⅞ inches diameter. All steel plates are ⅝ inch thick, except the ⅞-inch smokebox tube plate; all copper plates 9-16 inches, except the tube plate, which is 1 inch. Steam is taken from a dome, where the regulator is situated.

The firebox is generally the most troublesome part of the locomotive boiler. Roofing bars are heavy, and prevent the top of the box from being cleaned.

properly. Hence the introduction of the direct roofing stay. With the ordinary curved covering plate direct staying is difficult, although D. Drummond has had great success with his method. The best method of direct staying is found in the Belpaire firebox, in which the covering plate is flat topped. The Great Western standard boiler is the best example of the Belpaire type. The barrel is tapered, all the taper being above the center line. The Belpaire box is of the flush-topped type, while the sides of the covering plate also taper outward from the back. This method of tapering gives a great increase in the water and steam spaces about the box.

Belpaire boxes have either raised or flush tops. That is to say, the covering plate is either a few inches above the top of the last barrel ring, or on the same line with it. The flush-topped type is more expensive, as the covering plate flange on the front or throat plate has to be made by hand. The reason for this is that after the barrel flange has been made the flanging machine cannot make the covering plate flange satisfactorily, as the dies have no grip on the top of the throat plate. These conditions do not obtain on the raised-top type, and so the throat plate can be flanged by machine.

Mr. Ivatt, of the Great Northern, does not bring the firebox down between the frames, but carries them over on either side, thus securing a very wide box without restricting the water spaces. The tubes are 2¼ inches diameter. Although there is a loss of heating surface by adopting tubes of this size, it no doubt results in less wear and reduction of weight in the tube.

To increase the most efficient portion of the boiler heating surface, Mr. Drummond has introduced inclined water tubes, which cross the firebox from water space to water space. There are covers opposite the tube ends, studded to the covering plate, whereby inspection and renewal are amply secured.

The introduction of large-diametered boilers means a big increase in the height of the center of gravity of the whole engine, but given ordinary precautions this is preferable, as it entails less wear and tear on the permanent ways and wheels.

Boilers are usually fed by injectors, which are generally of the automatic restarting type. In some cases exhaust steam injectors are used. On two lines pumps are provided, with economical results. Gage glasses are usually fitted in duplicate, and are protected. They are, of course, provided with taps to enable a broken glass to be replaced. On the London & North-Western internal ball taps are provided, where the flow of steam and water is automatically stopped on a glass breaking.

Very little attention is paid to the design of smokeboxes, probably on account of the very slight knowledge obtainable of the action of the blast. In most designs there is a quantity of waste spaces in the box, in which the blast has to form a vacuum. Eddy currents are probably set up, causing efficiency to be lost. The most efficient smokebox would seem to be one embracing the tube area only, and changing by gradual curves into the plane of the exhaust. The blast pipe is as a rule high, the exhaust nozzle standing between the center line of the boiler and the top row of tubes. Low blast pipes are now finding favor, and should, theoretically, be more efficient. To promote freedom in the formation of the vacuum, smokeboxes should be as free as possible from steam and other pipes.

Balancing is a very important factor in the speed, riding and wear and tear of a locomotive. Balancing is largely a matter of compromise. The forces to be balanced are:

(1) Revolving masses. Weight of unbalanced parts of crank-webs + weight of crank pin + weight of large half of connecting rod.

(2) Half the reciprocating masses. Half (weight of piston and rod + weight of cross-head + weight of small half of connecting rod).

These disturbing forces require to be balanced in the wheels, the weights being inversely proportional to the distances of the center line of cylinder from each wheel. Thus, for a left-hand cylinder, the balance weight for the reciprocating masses is divided between the wheels so that the moments of each portion about the center line of cylinder are equal. These are placed opposite the left-hand crank. Similarly with the weights balancing the revolving masses. The balance weights for the right-hand engine are similarly obtained, and placed opposite the right crank. Thus there are two balance weights in each wheel, both opposite a crank. This is inconvenient, and the position and mass of a combined balance weight is obtained by the paralellogram of forces. A reduction in this weight is made, equal to half the coupling rod, which is opposite the crank. The other half of the coupling rod is balanced in the coupled wheel. For outside cylinders it is customary to balance the entire disturbing forces in the adjacent wheel. Balancing is simplified and greatly improved by the adoption of the built-up crank axle, in which the revolving masses are entirely balanced by the extended crank webs. This leaves only the reciprocating masses to be balanced in the wheel, and so reduces the weights in the wheel and the consequent hammer blow on the rails.

It has hitherto been insisted that the keynote of the British locomotive is simplicity. At the same time, engineers are ever on the search for ideas, which, while fulfilling all the conditions imposed by simplicity, yet make for the efficiency and economy of the machine. There are three systems now being experimented upon, to a greater or lesser extent, in England.

Superheating is being tried on one or two lines. In each case the waste heat in the smokebox is used to superheat the steam on its way to the cylinders. It entails a great number of steampipe joints and unions, besides filling up the box with piping, in which the wastage must be considerable. These practically condemn superheating upon the points of first cost and up-keep.

Throughout the history of the London, Brighton & South Coast, with the exception of the last ten years, feed-water heating has been the standard practice, to which, with certain modifications, the present locomotive engineer has returned. Part of the exhaust steam is trapped and turned into the tender, a pump being provided in place of an injector for boiler feeding. Mr. Drummond is also experimenting successfully with this system. He, however, passes his exhaust steam into a tubular condenser under the tender, round the tubes of which the feed water circulates. The substitution of a steam pump should not entail any additional expense, either in first cost or up-keep, and would probably be more reliable than an injector when dealing with bad qualities of water. This system should be the cheapest and most efficient way of securing economy in fuel, as well as reducing the cost of boiler up-keep.

Without going deeply into the subject of compounding, the author will endeavor to give a brief summary of the subject from the British point of view. In the first place, the locomotive works under completely different conditions to all other classes of steam engine in which compounding has been so successfully introduced. Compare the locomotive with the marine engine. In the latter the speed is constant; in the former it is changing every moment. In the marine engine the load gradually increases until the full power of the engines is being developed, when it remains practically constant. In the locomotive the greatest tractive effort is at the start and gradually decreases as the horse-power increases, while the actual load is constantly varying. There are, therefore, no factors from which the cylinder ratio can be determined, with the result that cylinder dimensions are obtained arbitrarily, with a view to suitability to the general arrangements of the machine. Again, much of the economy of the marine engine is derived from the use of the condenser, which is almost out of the question on a locomotive. Thus none of the axioms of compounding are available for application to the locomotive, and the question must necessarily be settled by actual performance, and not by theoretical considerations. Before proceeding further, a short description of the types of compound locomotives that have been tried in England will be interesting.

Two-cylinder engines on the Worsdell-Von Borries system were introduced on the North-Eastern. These were found to be uncertain in starting, while the balancing was peculiar, owing to the unequal weights of the high and low pressure motion. This caused bad riding, while the increased hammer-blow of the low-pressure balance weights caused excessive tire wear on that side.

Three-cylinder compounds on the late F. W. Webb's system (two high pressure and one low pressure) performed excellent work in their day, but the small size of the high-pressure cylinders made them uncertain in starting. They were engines requiring very clever handling, which could only be obtained with experience. They eventually got a bad name from being badly handled and from being overloaded.

Three-cylinder compounds on Smith's system have one high-pressure and two low-pressure cylinders. They are assisted in starting by high-pressure steam being passed into the low-pressure cylinders through a reducing valve. The balancing is very fair. Four-cylinder compounds are most favorably considered. The first introduced was that by the late F. W. Webb, in which two sets of Joy's gear drove the four valves. These engines are probably the best-balanced engines running, as the reciprocating masses balance each other, while the low-pressure revolving masses are balanced in the built-up crank webs, leaving only the high-pressure revolving masses to be balanced in the wheel. They were, however, inclined to be sluggish in running. Reverting for a moment to the difference between a locomotive and a marine engine, it should be noted that the methods of driving are different. The engine driver links up his engine to obtain speed, the marine engineer to reduce it. In other words, the marine engine is most economical at full power. Turning again to the Webb four-cylinder compound, linking up the two sets of gear resulted in excessive compression in the high-pressure cylinders, and consequently the engine lacked speed. Mr. Whale has recently added a separate Joy's motion to the high-pressure cylinders, and it is now possible to link up the high-pressure gear, while leaving the low-pressure in full gear, with the result that the excessive compression is done away with. The engine is correspondingly freer in running. Most four-cylinder compounds are built on similar lines, and usually have four sets of valve gear. The question of linking up is the first argument against the compound system. If a compound was always worked in full gear there can be no doubt that it would effect a very considerable saving in fuel over a simple engine worked in full gear. But a locomotive must be linked up to obtain the necessary speed. This causes the greater part of the expansion to take place in the high-pressure cylinders, leaving but little to be taken out in the low-pressure.

It is argued that in the simple engine it is possible to expand the steam to as great a practical extent in the one cylinder, and that the exhaust is not worth detaining to be expanded in a low-pressure cylinder. In other words, with equal boiler pressures and early cut-offs, the simple engine will be just as economical as the compound. But while working at late cut-offs, the compound will show an economy over the simple. Here lies a point in favor of compounding for mineral locomotives. This class of engine, when hauling the 700-ton loads that are nowadays so common, is generally worked at full power, with very late cut-offs. Neither is the full tractive effort required at the start, as with loose-coupled trains the wagons are picked up one by one. Thus a compound mineral engine should show considerable saving over the simple. If the compound passenger engine shows any economy, it is solely on account of the higher boiler pressures employed. Thus the superficial question is answered in favor of the compound. But the real question is, at what cost is this saving in fuel attained? It is seen that the economy in a passenger engine is due to the higher boiler pressures employed. It is generally agreed that with pressures over 175 pounds per square inch, boiler troubles increase out of all proportion to the increase in pressure. Thus it is probable that, with coal at the present price, the actual saving of a compound passenger engine is entirely swallowed up in the extra boiler repairs required. But leaving this on one side, there is the additional first cost of the extra pair of cylinders, rods and motion. These have to be kept up at considerable expense.

It is argued that the four rods and motion of a compound only do the same amount of work as the two of the simple engine. This is true, but the wear and tear of rods and motion is nearly as much due to idle running as to the stresses to which they are subjected. A four-cylinder compound must necessarily have two cylinders outside the frames. This introduces the steam pipe difficulty. There are in this type of compound at least nine steam pipe joints, as against five in a simple engine. And, again, there are double the number of glands to keep in order. The cost of their up-keep is probably greater in proportion, as there is always a great deal of condensation going on in the low-pressure cylinders, which results in greater wear in the glands. The oil consumption is, of course, correspondingly greater in a compound.

Bearing in mind that compounding has to pay for additional first cost, more frequent boiler repairs, increased cost of up-keep of engine and motion, and greater oil consumption, it is impossible for the compound system to pay its way in England while coal is at its present price. And herein lies the very bottom of the whole question. While coal can be obtained at its present comparatively low rate the compound has no chance in England. But there is a price at which compounding will pay, and when coal reaches that figure then the compound will become the standard British locomotive.

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The Smoke Nuisance.

Consul Henry H. Morgan, of Amsterdam, furnishes the following information concerning the prevention of sparks and smoke from locomotives and stationary furnaces in Holland:

In Holland all railway locomotives are under the supervision of the government and, under the law, must be provided with an apparatus for the burning of smoke, and also with an apparatus to prevent, as far as possible, the emission of sparks and combustible matter. Before a new type of locomotive is bought the railway company must furnish a drawing showing the details thereof to the Supervising Board of Railways, which decides whether the new type is acceptable; and for all locomotives purchased the company has to furnish the board with a statement containing, among other things, a description of the contrivance for the burning of smoke and of the contrivance to prevent the emission of sparks. Every locomotive has to be examined and approved by a government inspector before it can be placed in service. No locomotive would be accepted which was not provided specially with a contrivance for burning the smoke, and the burning by locomotives and stationary furnaces of bituminous coal, which would emit clouds of black smoke, soot, and deleterious gases, to the menace of the public health, would not be tolerated. The provincial and communal authorities are authorized to make and enforce regulations in reference to railways constructed on the public roads. The Province of Zuid-Holland, for instance, has prescribed that only coke is to be used on locomotives.

In reference to stationary furnaces there are no definite laws relating thereto, but they are covered by the nuisance law, according to which no building can be erected without a license from the town council. The license can be refused on account of public danger; injury to the premises, to trade, or to the public health; serious nuisance, making neighboring residences uninhabitable by reason of throwing into the atmosphere deleterious gases. Any person concerned may file an objection with the city council against any objectionable construction, the legal procedure in the premises being provided for by law. From the decision of the city council an appeal may be taken to the council of state, whose decision is final.—Daily Consular and Trade Reports.

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Technical Contributions

A MIDNIGHT COUNCIL OF THE AIR BRAKE FANS

BY WILL W. WOOD

Ten years ago, when the railroads of this country were commencing to put the quick-action, automatic brake on everything with wheels, The Air was the general subject of discussion, argument and question, in every congregation of railroad men—worse than politics this past year. One would think, however, that after all this time of association with the air brake, interest in the matter would have died down pretty well; but at regular intervals in the last decade something new in the equipment has been brought out, and changes made of such importance that the Air has been kept fresh, continually. And as to discussion and argument—why, if a fellow don't mix into these gabfests nowadays, he'll never get next to the ET equipment. I guess that Mr. Westinghouse has been "trying it on the dog," for now we've got the No. 6 style, and that means they have put out and experimented with six somewhat different species of the apparatus, each one of which we had to learn—and forget, except the last two; but they say that it can't be improved on now, and has come to stay; and since that last batch of engines came, with the No. 6 equipment, you can't hear any other talk than about the ET brake, and of the No. 6 in particular.

We had a mighty interesting talkenverein at two o'clock the other morning, in the reading room of the engine dispatcher's office at the roundhouse. Nearly all of the night-arriving passenger and freight trains get in to Smithville between 12:30 and 1:30 a. m. Old Hank Williams registered first, and after slewing the work report book around to the same angle in which the right-of-way perspective appears to him from the side cab window, Hank stuck his fountain pen in an apple that his fireman had bitten from and laid on the desk, to keep it upright, and made a trip over to where an "instruction piping diagram" of the No. 6 ET equipment was posted upon the wall. "Can't remember the names of them *two little copper pipes* from the distributin' valve, nohow," he announced; "one of 'em 's got see-sawed nigh in-two by the grate-shakin' riggin'. Beats all, how reckless they put up this ET pipin' —it's jest a 'castin' pearls afore swine.'"

"Say, Paw,"—from the fireman, between bites—"what do they call it the 'ET' for?"

"End of Trouble, son, or 'twould be if they give it some usual attention, after fastenin' it up right. I tell you, I've never been plumb confident in the automatic brake till I got the ET on my engine."

Every engineman on the road is interested in what to do in case of damage to the piping of the ET equipment, as there has been a number of cases of pipe failures with the new engine and tender brake, partly caused by a pipe being too short, straight and rigidly fixed, and, oppositely, in not being clamped rigidly enough in places; and the interest is particular regarding the two small copper pipes that connect to the left side of the distributing valve, on account of the supreme importance of keeping them perfectly free from leakage; and there is a difference in that respect, and in their further connections, as between the No. 5 and the No. 6 styles of equipment. Hank had been "breaking in" his new passenger engine on a fast freight run, and seemed to have had some recent experience that should become public.

"The only way I could remember what to do if I should-a broke off one of them little copper pipes to the No. 5 distributin' valve," said Hank, "was by makin' a rhyme about it, like—'thirty days hath September, Aprile'—an' so on."

"Sing it, Paw," requested his fireman.

"Here's the formula in prose," said Polk Barrows, the smooth tallow-pot—"of the two small, copper pipes, the lower ones of the three pipes connecting to the left side of the distributing valve, No. 5 equipment, if the bottom one breaks off, plug it towards the distributing valve—a blind gasket in a union is the best way; then disconnect a union *in the up-*

per one of the two little pipes, for it must be left open when the lower one is broken off and plugged, or else you can't release your locomotive brake with the automatic brake valve—the independent brake valve will be on the blink altogether, under the circumstances; you have now reverted to the common, automatic brake, so far as results from brake-valve operation go, for the independent valve is without effect, the holding position of the automatic valve won't hold the locomotive brake on any more—it has become simply another *running position*—and the release position of the automatc will release the engine and tender brakes the same as the old, G6 brake valve does; you can get along, with care, all right, but let this happen to an engineer after he has run the ET brake on freight for quite a while, and he will have a good object lesson on what it would mean to go back to the simple life—the old, plain automatic locomotive brake equipment."

"Suppose you are second in double-heading?" some one inquired.

"Proceed as directed, in regard to the broken pipe," was the answer; "but you needn't disconnect the upper 'little pipe' in that case, for, with your double-heading cock closed and automatic brake valve on lap, the upper one is routed through them to the atmosphere anyhow, and you will continue to have the advantage of a locomotive brake retainer against the head man's release made while running, by moving the automatic brake valve handle, temporarily, to the holding position.

"If the upper one of the two pipes in question should break off," continued P. Barrows, "you don't have to make any repairs nor apply any remedy, if you are in a hurry to go somewhere; but, its disconnection will permit the locomotive brakes to let off when the automatic brake valve is placed in the release, or holding positions, and your independent valve won't produce very much of a holding effect; and if you've got the time, and are not a following engine in double-heading, you had better plug it toward the distributing valve. In double-heading, on the following engines this pipe may remain open without changing the results any, except that you can't place the automatic brake valve to retain the locomotive brake cylinder pressure when the leading engineer makes an automatic running release. If both of the little pipes break off, the same rule holds good as in case of breakage of the lower one."

"With the No. 6 equipment you proceed different," observed Hank Williams. "It was the bottom copper pipe, which I see is called the 'distributin' valve release pipe,' that got sawed open on me, and I didn't do nothing at all toward fixin' things up, and the only difference I see was that the engine and tender brakes would let off when I put the automatic brake valve in release or runnin' position."

"There is nothing to do, in such case," stated Engineer McGinnis, "except to repair the pipe; and meanwhile you can get along, under the conditions just related by Mr. Williams. The locomotive brake will not hold well when applied by the independent valve, as the distributing valve will permit the pressure to pass to the broken pipe, from which it will escape about as fast as supplied. If the upper of the two—the 'application cylinder pipe'—should break off, plug it toward the distributing valve and make no other repairs or changes; the only duty of this last-named pipe is to accommodate the independent brake valve in its application and release of the locomotive brake, and to transmit the *maintaining pressure* from the automatic brake valve to the application chamber of the distributing valve when the handle of the latter brake valve is placed in the full, emergency application position. It is apparent, therefore, that the breakage of neither of the small copper distributing valve pipes will affect the other, in the No. 6 ET equipment, and if both pipes should break off, treat each one independently of the other, and in the same manner that I have just recommended."

That squelched further argument along that line, for McGinnis knows, and he had explained that part of the No. 6 piping pretty plain.

"Speaking of not appreciating the advantages in train and locomotive brake control that are being developed—to our incidental benefit," he further observed—"it reminds me of a passenger engineer who has the ET equipment and steadfastly refuses to profit by the duplex pump governor. His regular, running-position pressures are 110 pounds, brake pipe, and 125 pounds main reservoir—that is, when automatically controlled; but this man throttles his pump, so that with full boiler pressure it works slowly and steadily up to a red-hand pressure of *very nearly* 125 pounds, and, of course, when he applies the brakes—thus cutting out the excess-pressure governor—the pump does not start up and give him any greater pressure with which to effect prompt release.

"Now, it is a well known fact," he continued—to the deep interest of the gang, for McGinnis is "next to" the air, even if he is of pompous verbosity—"that 20 pounds excess pressure is none too much for prompt release on heavy passenger trains using the 70-pound brake; and with the high-speed brake, the pressure upon the triple-valve slide-valves—the big-faced, F29 slide-valves, too—at the greatly increased auxiliary-reservoir pressure—which is upon the piston packing-rings, also—will give an increased frictional resistance that requires more than 15 pounds above brake pipe pressure in the main reservoir to release them. But if you take advantage of the duplex pump governor, by setting the high-pressure top at the necessary releasing pressure, and run the pump with pretty fully-opened throttle, there will be no trouble experienced in brake release. Here, however, is an engineer who does not come up to the company's requirements, through his own stupidity—protecting his pump, to throw increased expense elsewhere—yet he holds on, and excuses his failures by laying his own shortcomings upon others, and inventing excuses. Why, certainly, his brakes are continually sticking and requiring bleeding-off by the trainmen."

"Let's bury old Jonah," said a voice from John's ("The Bat," night caller and engine dispatcher), private sanctum behind the wire screen, and up rose from his midnight couch the traveling engineer. "I know who you've got on your mind, McGinnis, and I'll add the latest chapter to his biography. Coming south on No. 5 yesterday, after he got over the knoll pulling out of Conway, he shut her off for that steep, nine-mile drop down the hill; and, meanwhile, the pressure-supply pipe had broken at its connection to the left-hand, driver-brake cylinder, but he didn't know that, and when he made his first application to hold 'em up the coach brakes took hold, but the air just blew out from the brake cylinder pipes of the locomotive, *and kept on blowing*, for it's up to the distributing valve to continually reinforce the brake cylinders against leakage. Well, now, there was that pipe exhausting the pressure steadily from the main reservoir, and the pump having been throttled against maximum boiler pressure, while the fireman had let his steam go back considerably so's she wouldn't howl all the way down the hill. He didn't notice the duplex gauge, and after he had got 'em pretty well in hand he thought he would go to release position and recharge the car brakes, keeping the train under control by the holding-on of the engine and tender brakes; when he tried it, though, the train brakes applied still heavier, for his main reservoir pressure had blown down to some less than that of the brake pipe. He glanced at the single-pointer gauge (he's got No. 5 equipment), and saw scarcely any pressure registered there; looked at the duplex gauge, and promptly got frazzled. He opened up his pump throttle, but it wasn't of much help, then, and the train brakes stopped him.

"He had passed a freight train, Extra South, at Linden Grove just over the hill-top from Conway, which it had got there for No. 4, in the first place, and that freight train was coming behind them, and No. 5 had just cleared the block; you know it's a bad place to flag, and an impossible place to stop on short notice. Jonah was too badly balled to locate the trouble at once, but he finally came to and shut off the main reservoir supply pipe at the distributing valve"—here one of the boys tried to break in with the argument that Jonah should have closed the individual cut-out cock in the broken pipe, and let the main supply pipe remain open; but the T. E. kept to the story—"Cap. Elliott didn't wait to find out what was the trouble, however, and with the boys—and that coon, Adjacent Smith, is a peach when excited—he got those auxiliary reservoirs bled sure quick, and old Jonah got 'em going just in time. The folks in that train will never know what a close call they had."

Then, argument began as to whether the engineer could have kept his main reservoir pressure above that in the brake pipe if his air pump had been working under full throttle and maximum boiler pressure. "I forgot to say," the T. E. explained, "that the pipe to the driver-brake cylinder was not broken clear off; it had cracked in the threads where the nipple enters the cylinder head, due to the piping having been connected up under a strain which bent the nipple over and opened the crack."

"Just listen to that," exclaimed Hank Williams; "some say the distributin' valve's the whole thing of the ET equipment, and I say it's all in the pipin'. Cite me airy case of serious trouble that's happened so fur to the ET brake out along this here pike, and see if it ain't traceable to somethin' wrong about the pipin'."

And Hank was so nearly correct that no one took up his gage of argument. The traveling engineer continued:

"We made a pretty fair test in the evening, and found that with 25 pounds of excess pressure to begin with, fully-opened pump throttle and full boiler pressure, he could have done the necessary braking down the hill and have brought his train in to Smithville on time.

"You see, the main reservoir was only losing air while the brake pipe was under reduction. The fireman said that he heard the pressure blowing out and told Jonah a pipe had bursted. Now, putting yourself in his place, you should have done this: catching on, from the fireman's information, you should have increased the brake pipe reduction, so as to quickly get the train speed broken down, and then have released the brakes, which, with plenty of excess pressure to start with, rapid pumping, and the reduced auxiliary reservoir pressures, would have been easy; all parts of the distributing valve would have been moved to their release positions, the supply of pressure to the broken pipe would have ceased, and before it became necessary to make another application of the brakes maximum pressure would have been attained in the brake pipe, and no doubt in the main reservoir, also. Anyway, he could have reached the foot of the hill with 70 pounds of air—with the high-speed pressure to begin with—on time, and no risky, stuck-brake episode charged up against his record.

"The right thing could have been done easily," the T. E. concluded, "but see, also, how easy it is to do the wrong thing."

There goes the 'phone; I'll bet there's three 71's, and it's a cinch that I'm it. I'll tell you the rest of it next month.

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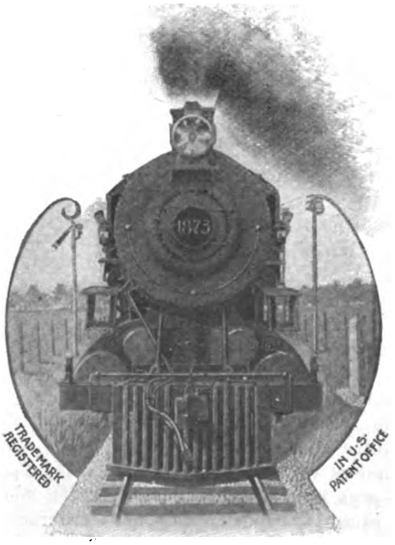

THE TRACTIVE POWER OF LOCOMOTIVES AND TRAIN RESISTANCE

BY C. B. CONGER

I have been asked to answer a number of questions on these subjects through the pages of the Technical Department and, while trying to be brief, will endeavor to be as plain as possible in making the explanations. The subject is one that, if treated so it can be understood by men who are without technical education, needs a more copious explanation than is allowable in these columns.

The tractive power of a locomotive, or the power that will draw a load along the track, is the power developed by its machinery that is effective where the driving wheels touch the rails, that is called the tractive power at the rail. As the weight of the engine and tender is a part of the load to be moved, the tractive power at the drawbar is the tractive power at the rail minus the resistance of the engine and tender.

The weight of the locomotive—which consists of the engine and tender—must always be considered as a part of the load moved. The weight of the engine is constant and is its weight in working order. The weight of the tender is variable, because the weight of the water and fuel on it varies with every mile run. Suppose a tender holds 8,000 gallons of water which weigh 8.345 pounds per gallon, it will have 66,760 pounds of water, and with twelve tons of coal there will be 45.38 tons more on it when starting out from a terminal with a full tender than when it is empty, so that the locomotive would have to draw 45.38 tons more with a full tender than an empty one. That should make the full train load a variable one if we consider the weight of the tender with that of the train.

The internal resistance of the locomotive varies a good deal with the type of the locomotive and the lubrication of the moving parts. For instance, tests made with a Mogul engine weighing 60 tons and having 20x26-inch cylinders, showed an internal resistance of 9 pounds per ton. On the same track a 100-ton consolidated engine with 21x32-inch cylinders, had an internal resistance of 19 pounds per ton, over twice as much. In making these tests the engine was drawn behind a dynamo motor car at a speed of ten miles an hour, and the resistance due to grade and rolling friction taken from the full amount.

A practical way to ascertain the internal resistance is to see at how low a pressure in the boiler, when getting up steam, an engine can be moved out of the roundhouse, and comparing the pressures necessary for the different engines. As a general proposition, the larger the engine and the more wheels coupled together the greater the internal resistance. In some tests made in Germany it was found that when the locomotive developed 1,800 horsepower that with a train resistance of 25 pounds per ton the train used 1,200 horsepower and the locomotive 600, or one-third of the total; this was a passenger train at an ordinary speed.

The tractive power available for drawing the cars is the pull on the drawbar of the tender. It is usually calculated for a speed of 10 miles an hour and is the tractive power generally used in making up tonnage ratings.

Before taking up the method of calculating the tractive power let us consider the adhesion of a locomotive, of the drivers to the rails, because if the tractive power exceeds the adhesive power the driving wheels will slip on the rails and nearly all the adhesive power will be lost. The adhesive power varies with the condition of the rails, due to weather conditions and the presence of foreign matters on them, such as mud, sawdust, leaves, oil, or anything that tends to make slippery the top of the rails. The character of the metal in the tires and rails also has an effect on the adhesive power, as, for instance, a very hard tire, which is usually a slippery one. The adhesive power also changes as the grade changes. In this respect it is greatest on level track and becomes less as the grade changes. On an upward grade there is a limit beyond which a locomotive cannot move itself, let alone draw any cars, and the same conditions affect a locomotive slipping on a down grade. It may be so steep that the adhesion will not allow the engine to be held on the grade.

Under ordinary conditions on a wet rail that has been sanded it is about one-fifth the weight on the driving wheels. With favorable conditions on a dry rail without sand it is about one-fourth. On a dry rail and level track, with the proper amount of sand, it is about one-third. By the proper amount of sand, we mean just barely enough on the rail to make the metal of the tires interlock closely with that of the rails, that is, the particles of sand are just numerous enough to roughen the surface of the rail when the tire touches it, and crushes the particles of sand into the metal. Too much sand is as bad as too little, for the particles of sand move over each other and reduce the adhesion while increasing the train resistance in drawing the car wheels over the sand.

To reduce this matter of adhesion to figures, we will say that an engine has 100,000 pounds on the rail where the drivers touch it. If the adhesive power is one-fifth it would be 20,000 pounds, and if the tractive power exceeds this amount the drivers will slip. If, by the use of sand on the rails, the adhesive power should be increased to one-third, or 33,000 pounds, until the tractive power reached this amount the drivers would not be apt to slip. A fair average used today is one-fifth, or 20,000 pounds tractive force for 100,000 pounds on the drivers, although some authorities say use 22,500 pounds, a ratio of four and one-half.

Usually the tractive power is calculated by the use of the formula:

$$\frac{D^2 \times S \times M.E.P.}{D} = \text{tractive force.}$$

This being interpreted into ordinary language means square the diameter of the cylinders, multiply that by the length of the stroke, and multiply that product by the mean effective steam pressure in the cylinder, this being estimated as 85 per cent. of the boiler pressure (15 per cent. being deducted from the boiler pressure to allow for the internal engine friction). This last product being then divided by the diameter of the driving wheel in inches, the quotient will be the tractive power.

To illustrate this we will take an 18x24-inch cylinder engine working with 180 pounds of steam and use 85 per cent. of the boiler pressure, 153 pounds mean effective pressure. With a 60-inch driving wheel outside the tire, the figures would be

$$\frac{18 \times 18 \times 24 \times 153}{60} = 19{,}828.8 \text{ pounds}$$

tractive force.

To familiarize yourself with this formula, make the successive multiplications indicated above the line and divide the last product by the number below the line; also try other dimensions and pressures till you become familiar with the operation.

Now as to the reason for, or explanation of, this formula. A formula is a short method of finding a result when quick work is of more consequence than the explanation of each step of the work. This formula is an example of quick work and accurate results. It has been used for many years, and is so nearly accurate that it can be relied on. We take the square of the diameter of the piston, multiply that by the stroke or the distance the piston travels, and that by the average pressure on the piston for that area and travel, and use the whole diameter of the wheel as a divisor. We do not use the actual area of the piston nor the actual length of all the levers in the crank and wheel, but the formula works out very correct results.

It may be asked, "Why not take the actual area of the piston in inches, multiply it by the mean effective pressure of steam against them, which will give the actual power delivered at the crank pins, and then make a leverage calculation in which the distances of the crank pin from the center of the axle (at right angles to the direction of its power) will be one arm of the lever and the distance from the center of the axle to the rail is the other arm of the lever?"

You can do this, but it takes longer than with the formula and you will find that the leverage of the crank pin changes at every point of its movement from its greatest power on the quarter to nothing on the dead center. While working out this problem in leverage you will find out that the sum of the leverages of the cranks on both sides of the locomotive equals 1. That is probably the reason why the formula uses only one cylinder and gives it a leverage equal to the full stroke. If that method looks too hard, take one of the rules for finding the weight that can be moved by a certain lever when you have the amount of power used. Multiply the power by the distance the power moves, divide that product by the distance the weight moves; the quotient will be the weight. Another way to state this method is, multiply the distance the pistons move in making one turn of the wheels by the mean effective power of the steam against the pistons, that is, the area multiplied by the pressure; divide this product by the distance the engine moves and the quotient will be the tractive force. To take the 18x24-inch engine again as an example, the area of the piston is 254.47 square inches; this multiplied by the pressure of the steam, 153 pounds, and that product by the distance the piston moves while the wheel makes one revolution, two strokes, or 48 inches, will be for two cylinders 3,737,655. Divide this product (which represents the power multiplied by the distance it moves) by the circumference of the 60-inch wheel in inches (188.496 inches, the distance the engine moves), and you will have the same result the formula gives, 19,828.8 pounds = tractive force.

This formula gives a result representing the best work the locomotive is capable of doing. If the boiler carries less steam on a hard pull than the pops are set at she will not do the work calculated, and in all cases the actual pressure as shown by a correct gage must be used in the computations. When the steam blows past the cylinder packing rings or by the valve or its seat, a loss of power results and the tractive force is much less than when everything is steam tight. Deficient lubrication also pulls down the tractive force. If the valves do not distribute the steam to the cylinders in the best possible manner the actual tractive force will not come up to that estimated.

A choked exhaust that causes a back pressure against the piston will seriously affect the tractive force, while at speeds exceeding 10 miles an hour the compression due to an early closing of the exhaust cuts quite a figure. Just remember this fact when taking a run for a hill with the exhaust nozzle choked down so as to handle an extra heavy fire.

Cutting off steam at less than full stroke also reduces tractive power. For instance, at 100 revolutions per minute with a 60-inch wheel, which would be nearly 18 miles per hour, the mean effective pressure at a 25 per cent. cut-off, or at 6 inches of the 24, would be 29.6 per cent. of the full pressure. At a 30 per cent. cut-off the mean effective pressure would be 42 per cent. of the boiler pressure, at a 40 per cent. cut-off the mean effective pressure would be 49.9 per cent. of the boiler pressure, a 60 per cent. cut-off would give a 63 per cent. pressure. Remember when we speak of full stroke, that a 24-inch stroke engine usually cuts off at about 22½ inches, sometimes as close as 23 inches of the 24 inches. In explanation of the rule that allows 85 per cent. of the full boiler pressure as mean effective pressure, will say this is intended to allow for the internal friction of the machinery, which is estimated as using about 15 per cent. of the power of the steam.

The work of computing the tractive force of engines having the same size of cylinders and driving wheels, but using different pressures of steam can be shortened by computing the tractive force for each pound of mean effective pressure in the cylinders. This result for one pound pressure can then be multiplied by the number of pounds for each different engine and shorten the work considerably. We will take the same engine used for the first calculation: 18x18x24=7,776, and 7,776÷60=129.6 pounds tractive force for each pound mean effective pressure used in the cylinders. Multiply this by 153, the pressure used in the first calculation, and we again have 19,828.8 pounds tractive force. If the boiler pressure has been 150 pounds, 85 per cent. will be 127.5 pounds. This multiplied by 129.6 will give 16,524 pounds tractive force, and for any other pressure you can work the same way.

It may puzzle some when changing tractive force into horsepower, for it is found that as the speed of the engine increases the tractive force decreases and the horsepower developed increases. Tractive force while usually calculated at a speed of 10 miles an hour, does not take into account the distance moved. Horsepower always does, for horsepower is calculated as the product of pressure or work multiplied by the distance through which the work is performed. If you bear this fact in mind you will see that the horsepower developed by the engine running at 40 miles an hour with a train that it can just handle at that speed will be a great deal more than the horsepower developed by the engine handling a full train at 10 miles an hour. To get the horsepower of a locomotive when you have the actual drawbar pull and the speed, multiply the drawbar pull by the speed in miles per hour and divide by 375; the quotient will be the horsepower.

The mean effective pressure is also affected by the piston speed per minute. Increasing the piston speed from 250 feet per minute to 1,400 feet cuts down the tractive force from 1 to .27, only a little over one-fourth as much.

The speed at which an engine is moving also affects her tractive force, because as the mean effective pressure reduces with the increase of speed, the tractive power reduces. An engine with 69-inch drivers makes 292.2 revolutions in going a mile, and with 26 inches stroke the pistons will travel 1,266 feet at 60 miles per hour; the mean effective pressure will be 54 pounds from a boiler pressure of 200 pounds. With the same engine at 50 miles an hour the mean effective pressure will be 64 pounds, and at 40 miles an hour the mean effective pressure will be 80 pounds. So you see a quick piston speed is not a good way to get all the power out of the steam with a locomotive. To reduce the piston speed very large wheels are used on express engines, as well as a moderately short stroke.

The American Locomotive Company and the Baldwin Locomotive Works issue bulletins on this subject that contain valuable tables and other information. If you wish to go deeper into it send to them for their bulletins on Tractive Force.

Train Resistance.

A study of the methods of computing the tractive force of a locomotive naturally brings up another question of interest to enginemen and trainmen, that of train resistance. This is generally stated as so many pounds tractive force necessary to move a ton of weight in cars on a railroad, this amount of tractive force being always calculated on the various conditions of grade, curves, speed, track and equipment.

The train resistance due to grade can be accurately stated, for it takes exactly so much power to raise one ton up each foot of a grade at a certain speed per minute. You can plainly see that, leaving friction out of the case, it will take exactly 2,000 pounds tractive force to raise one ton perpendicularly. Dividing this amount by the number of feet in a mile, 5,280, will give a quotient .3788, which is the factor for each foot of raise of grade in one mile. A one per cent. grade, which is 52.8 feet per mile, will require .3788×52.8, or 20 pounds per ton tractive force to overcome the grade resistance for each ton drawn up a one per cent. grade.

Curve resistance has been very closely estimated from a great many tests as one-half pound per ton for each degree of curvature of the track. Thus a 3 degree curve would be 1½ pounds per ton, and a 10 degree curve would make it 5 pounds per ton. The elevation of the outer rail on a curve is a factor also, as the elevation on a curve suitable for a fast passenger train will be too much to haul a very slow freight train around easily. The resistance a train makes to being pushed around a curve is a good example of flange friction that is exaggerated by the wheels being crowded against the outside rail.

The condition of the side and center bearings of cars has considerable to do with the flange friction of a truck that can not curve easily when entering a curve or when leaving one for straight track. The condition of the side bearings has so much to do with the amount of tractive force absorbed that it requires a separate test for each car to arrive at accurate results.

Speed resistance varies according to conditions. The table of the American Locomotive Company gives it as 5 pounds for ten miles per hour; 5.5 pounds for 15 miles per hour; 7 pounds for 25 miles per hour; 8 pounds for 30 miles per hour; 10.4 pounds for 40 miles; 13.4 pounds for 50 miles; and 17 pounds for 60 miles per hour.

A strong head wind is quite a factor in increasing train resistance. Some tests made on the C. B. & Q. R. R. in 1888 show that a train of 344 tons, at a speed of 44 miles per hour, had a speed resistance of 9.5 pounds per ton, a train of 317 tons at 41 miles had a speed resistance of 8.4 pounds per ton, while a train of 267 tons at 39.8 miles against a head wind had a speed resistance of 10 pounds per ton. A longer train of 329 tons, two more cars, at 39.5 miles showed a resistance of 13 pounds per ton. The velocity of the wind was not given.

It is a well known fact that a quartering wind that catches the forward corner of every car will hold a freight train back more than a wind that is dead ahead.

A locomotive will draw more tons of load on a very heavy stiff rail than on a weak one, that is, the same locomotive will draw a heavier train over a 100-

pound rail with a solid roadbed with good ties than it will over a 56-pound rail with a roadbed and ties that allow the rail to spring down as the trucks pass over it. This is because the engine and each car as it passes along depresses the rails, ties and ballast so that the entire train is in a series of depressions that follow each other along the track like waves. It takes more power to pull the train along and crowd the rail and ballast down at each car than it does to move the train when the rails and roadbed are so stiff and solid that the surface is a straight line.

Insufficient lubrication of the journals is also a waste of tractive power in that it makes more train resistance than is necessary. The exact amount of this resistance varies with the conditions, from the journal well lubricated to the one that is hot with particles of the journal and bearing torn off.

And now as to the method of using this information in the work on the road. If you know that an engine will just barely handle a certain number of tons on a certain grade at a speed of ten miles an hour and you want to know how much an engine of another size and different tractive power will handle on that same grade, first figure out the tractive power of the engine that has been tested. Then divide this tractive power by the number of tons that is a full load and the quotient will be the number of pounds tractive power required for a ton on that grade. You will find that some of the grades that are rated at one per cent. will take 26 pounds for a ton, while other one per cent. grades will take as much as 30 pounds. This will give you an idea that a one per cent. grade is a variable quantity.

Then calculate the tractive power of your own engine and divide its power by the number of pounds per ton necessary on the hill; the quotient will be the number of tons you should bring up there. This can be followed out on all the stiff pulls on the entire division and prove a check on the tonnage rating.

In most of the tonnage ratings put out by the railroad companies the weight of train between the tender and caboose is stated. This simplifies the work of the yardmen and trainmen in figuring up the total train load. As the weight of each locomotive in working order is known, this weight, as well as that of the caboose or way car, is subtracted from the total load the engine is capable of moving; the remainder should be the weight of the train exclusive of the locomotive and caboose.

The tonnage rating has to be some different for empty and loaded cars as well as for light capacity loads as compared with heavy capacity loads. The fewer cars that the full tonnage can be loaded in the easier the train handles in every way except braking on steep grades; there the extra heavy cars do not hold back as well as the light ones. But as the limit for a train of empties in number on most level roads is away below the full tonnage load, it makes no difference. On a hilly road where the trains are short, there is a percentage taken off the tonnage when the train is made up of empties. Empty cars or loads of light capacity have a greater train resistance in every respect except gravity, and there is an allowance to be made for it.

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ELECTRICAL RAILROADING

BY ELWOOD GRISSINGER

Drum windings for armatures are divided into two kinds, known as the parallel or lap, and the series or wave winding. The series winding may or may not be given an angular lead with respect to the armature slots, i. e., the armature lead from a coil may be brought out straight to the commutator segment or it may be carried forward or back a certain angle. The only reason for not bringing the armature lead out straight to a commutator segment would be to get a certain position for the proper support of the brushes. The series winding may also be bunched in the slots, whereby it becomes possible to place more than one armature conductor in the same slot when the different conductors are carrying current in the same relative direction through the slot in which the conductors are placed. It is in this manner that the total number of armature slots can be reduced. This is an advantage in reducing the fly-wheel effect of the armature, for it makes possible an armature of smaller diameter.

The parallel or lap winding will not be described at this time, because it has given way almost entirely to the series or wave winding when applied to railway motors. The lap winding is used in dynamos. It is not desirable in motors for the reason that with four-pole motors four brushes would be necessary, as well as double the number of commutator segments as compared with the series winding. Fig. 12 of the last number of the Magazine illustrated a series winding for a two-pole motor. If this motor had had four poles and a lap winding, then there would have been four brushes instead of two. Street railway motors are completely enclosed and unless taken apart the brushes and commutator can only be reached through a small opening at the top over the commutator. There is a rectangular hand-hole with a hinged cover at this part of the motor frame. All car floors are so made that a part of them can be lifted away from over the motors and in this way access can be had to the brushes or the commutator without the necessity of removing any other parts or of running the car into the barn.

The two brushes used with a wave winding will therefore be arranged so that they will be supported from the top of the motor frame. If there were two more, they would come at the bottom. They could not be inspected or kept in repair conveniently when so located. The question of angular lead between the conductor in a slot and its commutator segment will be referred to more fully in connection with a diagram.

Having shown a simple two-pole motor winding, the question may suggest itself as to why four-pole motors have been adopted to the exclusion of two-pole motors for railway work. A railway motor must be enclosed. At the same time, it must be so constructed that it can be taken apart easily and quickly for inspection and repair, or for the removal of an armature or a field coil. This is very satisfactorily accomplished with a four-pole frame, but not with a two-pole field. Four field coils will run cooler than two when carrying the same energy, because of the greater radiating surface. Slower armature speeds can be obtained with a four-pole field than with half the number. A perfectly balanced magnetic field is possible with a four-pole field. The rotary motion of the armature is therefore less harmful to the bearings.

A straight series or wave drum armature winding is shown by diagram in the upper and lower parts of Fig. 1, herewith reproduced. "N" and "S" are the alternate north and south poles of a direct current railway motor. The field coils are separate and distinct from the armature and are not shown. The armature in the figure has 22 slots, there being half as many commutator segments as there are slots, or 11.

As previously shown for a two-pole motor, in the upper part of the figure, the armature conductors at the commutator end are drawn in unbroken lines. Where these conductors cross-connect at the back of the armature they are shown by dotted lines. The brushes are $K+$ and $K-$ as before. The lower half of Fig. 1 shows what the faces of the field poles, armature conductors and commutator segments would look like if the motor were divided parallel to the axis on a vertical line through the center of the armature and then everything flattened out and brought side by side.

The commutator segments are numbered *1* to *11* inclusive. The armature slots are lettered from *a* to *v*. The number of bars in the commutator when used in connection with this style of winding is always half the number of armature slots. The number of bars in the commutator of a series wound armature is always an odd number. The armature winding is divided into two circuits between the positive and the negative brush. Because of the fact that this type of winding is in series and of two circuits only, it follows that each circuit will carry one-half of the total energy as against the four circuit, four-pole lap winding, which would carry but one-fourth of the total energy per circuit. The wave winding therefore has but half the number of conductors of the lap winding, but these conductors must be approximately twice the size of the other for the same motor capacity. The winding has been termed a series winding because one-half of the armature coils are always connected in series with one another through the medium of the commutator. It is also called a wave winding because when tracing the path followed by any one lead it is seen that it passes back and forth all the way around the armature without lapping over its mates. This is brought about by a change in the connections to commutator bars without changing the relative position of the coils themselves.

In the figure the commutator end is called the front end of the armature, the other end, or that end of the shaft upon which the gear pinion is placed, will be called the back of the armature. It is assumed that each armature coil has but one turn of wire. The armature of the figure does not have any bunched slots, therefore there will be but one armature coil to each slot. For instance, from segment *1* of the commutator, a lead goes to slot *v*, thence from front to back and across the back as shown by the dotted line, to slot *e*, thence from back to front over a lead to segment *6*. This constitutes one complete armature coil. Each slot coupled with the fifth one from it has an armature coil laid into it. One coil occupies slots *r* and *a*, another *b* and *g*, another *c* and *t*, and so on until the 22 slots are divided into 11 pairs.

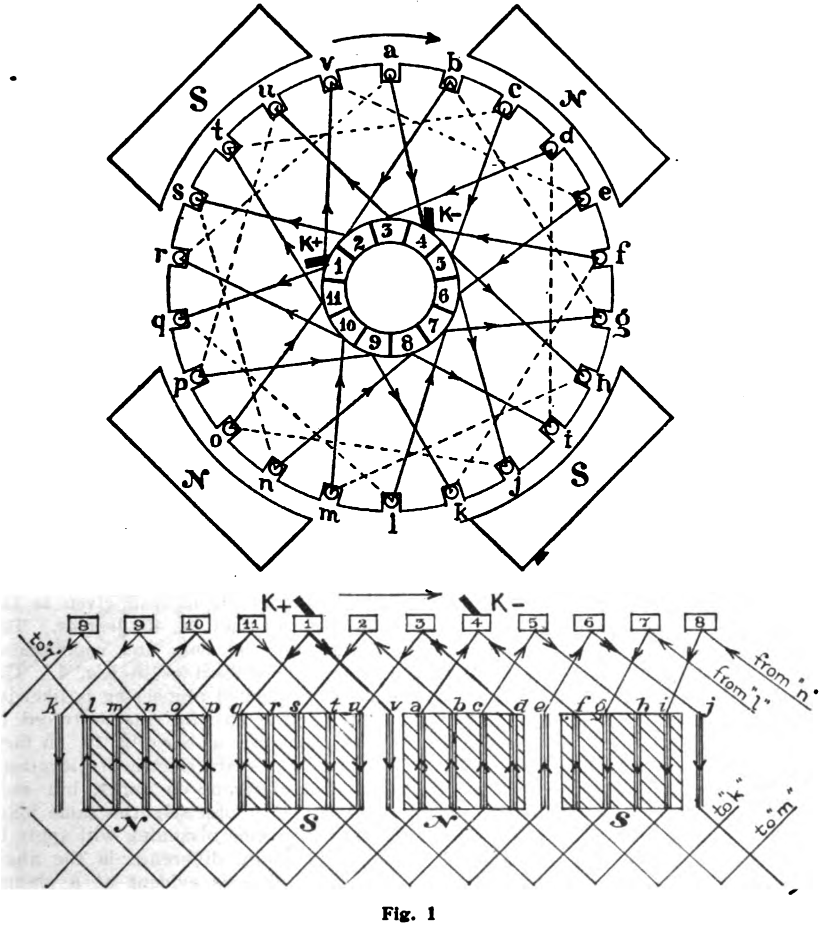

Fig. 1

The series winding is best shown by following any circuit around the armature from a brush. In illustration, start at segment 1 over the lead to slot *v*, across the back to *e*, to segment *6*; to slot *j*, across the back to *o*, to segment *11*; to slot *t*, across the back to *c*, to segment *5*; to slot *h*, across the back to *m*, to segment *10*; to slot *r*, across the back to *a*, to segment *4*. One circuit of the armature has thus been traced from the positive to the negative brush, or from where the current enters the motor until it emerges from the same. The circuit may likewise be traced in the lower half of the figure, when the term of wave winding will probably be the better understood.

The direction of the current in the armature conductors is also shown by the arrow heads on the leads. From this it will be seen that across the face of a north pole the current is passing from the bottom to the top (in upper part of figure, from back to front); and over the south poles the current is passing from top to bottom (in the upper part of figure, from front to back), i. e., current always passes in a different direction across the face of a north or a south pole. This also illustrates a statement previously made, that every dynamo or generator generates an alternating current within itself. The commutator makes it a direct current in the case of a generator, and changes direct current into alternating through the armature leads in the case of a direct current motor.

The particular case of Fig. 1 assumes the motor armature to be rotating in the direction shown by the arrow at the top of the figure; or in the direction of the hands of a watch. If, however, the polarity of the field poles were changed so that what are now "N" would become "S," and what are now "S" would become "N" poles, then with the same direction of current in the armature conductors the armature would rotate in the opposite direction. Or, if the polarity of the poles remain the same as in the figure and the direction of the current in the armature is changed so that current passes in the opposite direction to that shown through the conductors across the pole faces, then the direction of rotation of the armature will be changed. A change in the polarity of the field poles and of the direction of armature current at the same time does not change the direction of rotation of the armature. One or the other only must be changed to effect a change in direction of rotation of the armature. This is what takes place in street car motors when they are reversed. The reversing handle on the controller changes the direction of the current through the armature, leaving the field polarity the same.

Some motors are built having an angle of lead between the commutator segments and the armature conductors. The field poles may be placed on the horizontal and the vertical instead of at an angle therewith, as shown in Fig. 1. When this is the case in a series winding the armature leads would come out in such a way to the commutator that the brushes would be shifted 45 degrees around and would therefore stand in a position difficult and awkward to reach. To overcome this and bring the brushes into a position similar to that shown in Fig. 1 the commutator is virtually turned 45 degrees about the shaft, or, in reality, the armature leads are carried just that much farther around to accomplish the same thing. Simple series or wave windings might appear complicated when it would be due merely to the angle of lead.

The position of the brushes with respect to one another is always fixed. They are always 90 degrees apart. If there are more than two sets the adjacent sets are always 90 degrees apart. In railway motors, when the brushes are referred to, one set is always inferred. Railway motors are so designed that the position of the brushes is fixed with respect to the frame. They cannot be moved around the periphery of the commutator. This is another reason why the armature winding is always arranged so that the brushes will be at the top, and why in many windings an angle of lead is given to the winding.

Fig. 2 shows a four-pole series winding, with an angle of lead given to the winding equivalent to 45 degrees. The same number of slots and commutator bars have been used as in Fig. 1. The same lettering and numbering is likewise adopted. The circuits can be traced in the same manner as for Fig. 1. In fact, the two figures are electrically identical. They look different on paper, but each will operate in precisely the same manner and the same reasoning will apply to both. The only difference is the angle of lead. This is evident at a glance, since the lettering, etc., is relatively the same. In Fig. 1, slot *o* has a coil that is connected in front to segment *11*. In Fig. 2, slot *o* has a coil that is connected in front to segment *8*. One lead of a coil now comes almost straight to a commutator segment, while the other is carried some distance around.

The question of the number of turns of wire in each armature coil is one of design to meet the conditions. The speed to be maintained with given load, the grades encountered, curves, number of stops, acceleration, etc., must all be considered in the design of a successful railway motor. An armature with a small number of turns of wire is speedier upon a level track, but it is also less powerful, i. e., has less *torque* with the same size of wire than an armature with a greater number of turns. This is because by increasing the number of turns of wire wound upon an armature, the ampere-turns (amperes of current flowing, multiplied by the number of turns) are also increased. Increasing the ampere-turns of the armature means increased magnetic lines in the armature, and this means a more powerful action between armature magnetic lines of force and the field magnetic lines of force.

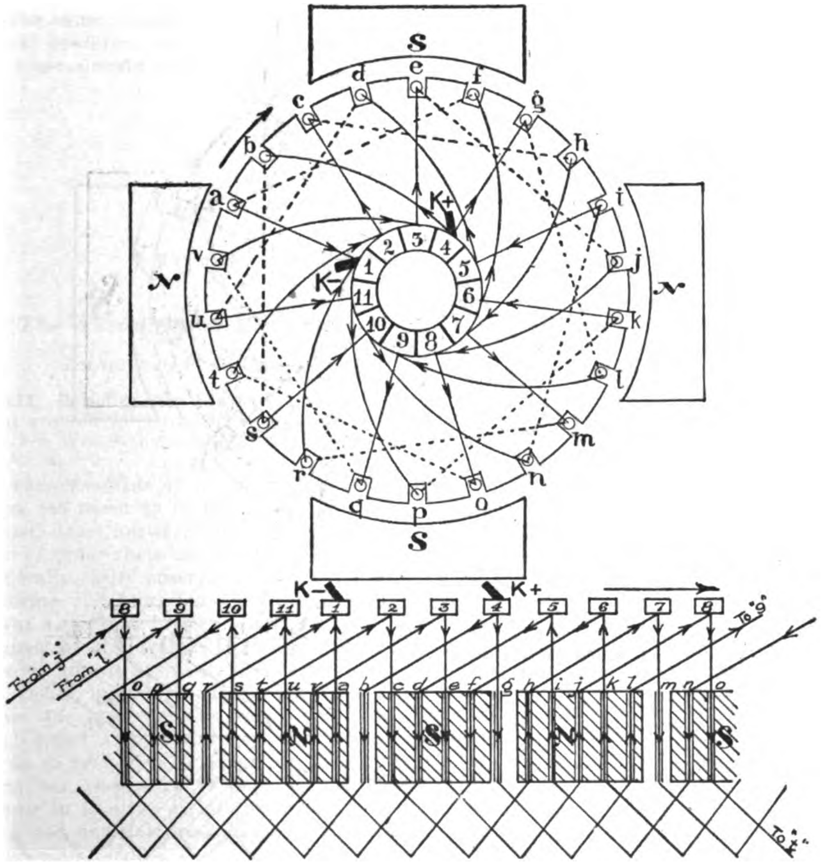

Fig. 2

Reference has been made to armatures with bunched slots. The design of machine wound coils for this class of armature is much more difficult than the types already described. The principal reason is, that unless great care and skill are exercised, too many neutral slots will appear. Neutral slots are those in which two or more coils might lie, each coil carrying a current in the opposite direction. Their effect would therefore be neutralized. While the bunching of armature conductors reduces the number of slots and makes possible an armature of smaller diameter, it also necessitates a commutator with a large number of bars, generally twice the number of slots, and sometimes three times the number. An example of an armature winding with bunched coils is shown in Fig. 3.

In this example, the same number of armature coils are used as in the other figures, as well as the same number of commutator segments. Slots *a* and *b*, *c* and *d*, *e* and *f*, etc., of Figs. 1 and 2 are combined in Fig. 3. Each armature conductor has another armature conductor in the same slot with it, and in every case in the example shown, except one, the current passes in the same direction through each coil in a slot. The one differing from the others is slots *o* and *n* combined as one. For the particular position of armature in the magnetic field at the instant shown in the figure and the corresponding position of the commutator and brushes, the current in the slots *o* and *n* for one coil is up while it is downward in the adjacent coil in the same slot. This is shown more particularly in the lower half of Fig. 3. These two currents neutralize one another, but inasmuch as this slot is at a neutral position with respect to the magnetic field when the currents are in opposite directions in the same slot, it does not affect the operation of the motor as a unit.

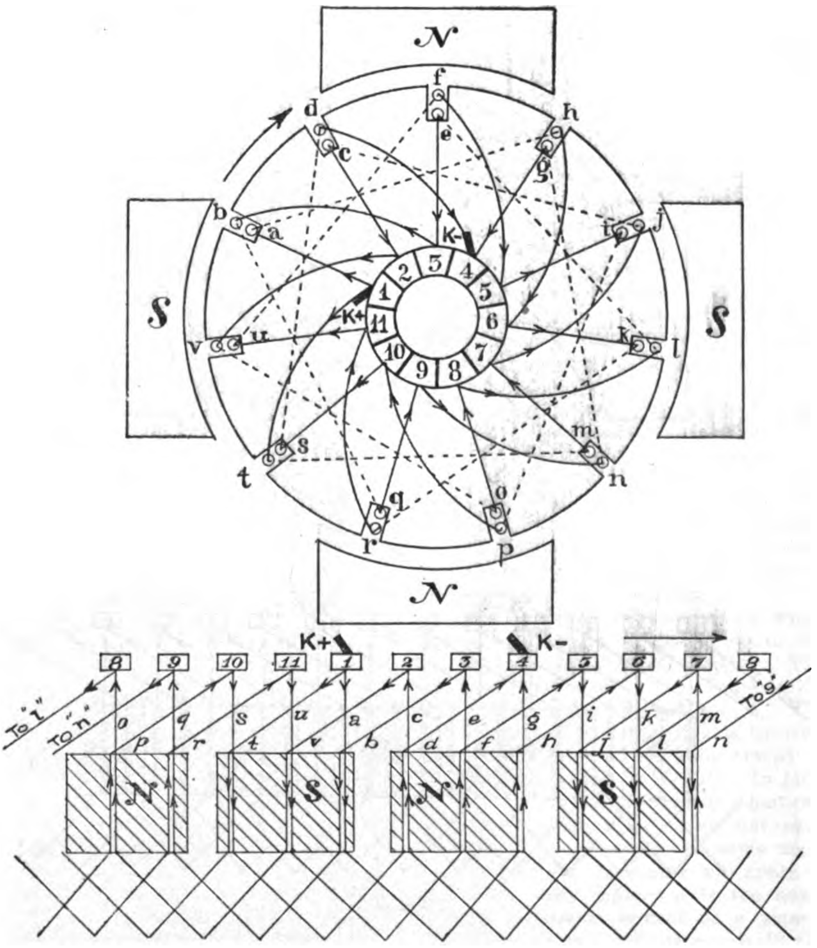

Fig. 3

In the lower half of Fig. 3 the armature conductors are lettered instead of the slots, and this lettering is the same as is used for the slots in Figs. 1 and 2. This method of winding armatures permits of so designing the coils that they will interlock with one another at the back of the armature when they are in place. This greatly increases the strength of the winding against the effect of rotative forces. Moreover, it is a simpler task to build an armature with a smaller number of slots.

The same reasoning applies to the electrical operation of this type of winding as those already shown. The path of the current in the winding and its direction can be traced in the same simple manner.

It should be understood that the diagrams forming a part of this article do not represent actual motors, but are only intended to illustrate graphically the style, of armature windings in general use. Actual motors, while built in general accordance with the figures, would have a different number of armature conductors, armature turns of wire, armature slots and commutator segments.

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Questions and Answers

The Westinghouse Air Brake.

Answers by F. B. Farmer.

417. Defective Air Pump.—"How would you proceed to locate the trouble in a defective Westinghouse eleven-inch pump?" —*N. K.*

Answer.—This is a very broad question, too much so to permit of the most satisfactory answer. When a pump is out of order there are always symptoms, generally easily observable, that not only indicate the fact, but that are also of great assistance in locating the cause or causes of the trouble. Unless the engineer knows positively what is wrong he should, in making out the work report, state the symptoms as well as the actual defect and repairs desired. Failure to do so prevents the repairman from adding his knowledge to that of the engineer in locating *all* of the defects, and is a not unusual cause of lost time and inadequate repairs.

In the absence of symptoms for this case we will have to consider the question as asking how to test an eleven-inch pump, and which would apply as well to the nine and one-half-inch size, for any possible defects. An engineer should invariably test the air pump before going out with an engine so as to obtain the best possible assurance against any trouble arising from it during the trip. This test, which is easy and takes little time, is as follows:

Having obtained full brake pipe and main reservoir pressures, handle of the automatic brake valve in running position, *listen* at the pump suction (do not cover it with your hand or else) and note how nearly the suction or inflow of air continues to the end of each stroke; also whether there is any leakage, told by sound, past either receiving valve. Also, see that the strainer is clean.

Bearing in mind that the slower the speed and the higher the main reservoir pressure the more severe is the test, if the suction ends considerably before each stroke is completed and the strokes are even it indicates leakage past the air piston packing rings. Another symptom of this defect is a very smooth working pump, having little or no thud as it reverses strokes. Also, the exhaust will be softened.

If the suction is much shorter on one stroke than the other, the stroke uneven and quicker in the direction where suction is shortest, look for a leaky discharge valve at the end from which the piston travels in making the quicker stroke. Another symptom of a leaky discharge valve is a pale brick red color of the boss or projection in which this valve is located. The discharge valve leakage increases the heating and the latter causes the red color.

In both these cases it is assumed that receiving valves and air cylinder stuffing box do not leak. Leakage at this stuffing box or either receiving valve will cause an irregular stroke. A leaky receiving valve cannot be felt because the air blown back is drawn in past the opposite valve, However, it can be heard by listening close to the suction opening.

A loose air piston will cause an unusual click or pound. The only way to recognize this is to pay such attention to the varying sounds of pumps at work, and without this defect, as will enable one to note the different sound when the fault is present. Making the air piston repairs with the pump on the engine is probably the commonest cause of loose air pistons.

It takes many times longer to read this test than to make it. Neither does it involve any labor, merely looking and listening for a few seconds. Why should any engineer neglect it? Some, at least, do. They have the most pump failures, too. There are other tests that can be made to advantage at times, but if the majority of engineers will employ the foregoing *regularly* and promptly report defects it indicates, a marked improvement will follow.

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418. Westinghouse Slide Valve Feed Valve.—"Please explain how a dirty slide valve feed valve would regulate train line pressure. Would it overcharge train pipe and give chances for sliding wheels?"—*N. L. K.*

Answer.—This feed valve is so designed that if it sticks in either position it will be in the open one. This is the safe side, as it gives too much brake pipe pressure, instead of too little. Just how the dirt will affect it depends on what part the dirt prevents from operating as intended. The piston is moved to the open or feed position by main reservoir pressure exceeding that in the brake pipe. This insures an ample power to move it, no matter how dirty. It is moved to the closed position by its spring when the air pressures on its opposite sides are equal. Hence, if dirt sufficiently increases the resistance of the piston and its supply valve as to overcome the power of the piston spring the feed valve will remain open. This would allow brake pipe pressure to increase to that of the main reservoir. Should the jarring of the engine then cause the piston to close the supply valve the brake pipe pressure would then leak down until it got below the adjustment of the feed valve, which would be very likely to cause brakes to apply and stick.

In fact, a lesser amount of gum or dirt on the piston or gum on and about the regulating valve will cause the feed valve to vary the regulation of brake pipe pressure from four to six pounds. This would also tend to cause stuck brakes. Such an action may also cause undesired quick action, the brakes applying in emergency with the brake valve handle in running position or immediately on it being moved to service position.

Another cause of too wide a variation in the regulation of brake pipe pressure is binding or friction in some of the regulating parts of the feed valve. The spindle, bearing against the diaphragm and having its stem extending through the regulating spring, should be as free from friction as possible. Sticking brakes are always liable to cause wheels to slide and flatten.

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419. Brakes Not Releasing.—"To what cause would you assign it if a brake did not release when the auxiliary is bled? With the brake cut in, when auxiliary is bled, could a defective emergency rubber-seated valve leak sufficiently to cause this?"—*N. L. K.*

Answer.—The question indicates that occasional defect where there is a strong and continuous blow at the exhaust from the brake cylinder, as long as the brake pipe pressure is maintained, and bleeding the auxiliary reservoir will not release the brake. This is due to the emergency or rubber-seated valve being held away from its seat. The usual cause is the emergency and check valves being stuck together after an emergency action of the triple valve, as when charged brakes are cut in quickly after coupling the hose. The writer met with one case where a bent emergency valve stem cocked the emergency piston and held the valve open after an emergency application.

In an emergency application the lower stem of the emergency valve is driven into the hole provided for it in the check valve. If there is a burr on this stem of the emergency valve, as may result from lack of care in putting a new rubber seat in it, they may stick so that the check valve spring cannot separate them.

With an empty brake cylinder and the brake pipe pressure raised quickly, both would be raised until the emergency valve seated and nothing unusual would be noted. However, after any full application of this brake, whether service or emergency, this brake would continue to blow at the exhaust port, would remain applied and could not be bled off.

The reason is that the full application would cause both valves to drop until the check valve seated. When release was attempted the pressure in the brake cylinder would prevent the brake pipe pressure, raised as quickly as it could be from the engine, from raising the valves more than part way to the upper position. The opening by them would be so much larger than the exhaust port as to keep the brake applied, though the triple valve were in release position. The blow at the exhaust would be supplied direct from the brake pipe. As the triple valve would be in release it will be seen that bleeding the auxiliary reservoir would not aid, as it would not seat the emergency valve.

Tapping the check valve case or lower portion of the triple valve may cause the stuck valves to separate and allow the brake to release, though they may stick again after the next emergency application. Another temporary remedy is to cut out that brake, bleed all air from the auxiliary reservoir and then open the cut-out cock quickly. The sudden rush of brake pipe air, now that the brake cylinder is empty, or almost so, will lift both valves and seat the emergency valve. But if they are yet stuck together the same trouble will again result in an attempt to release after a full application, no matter how made.

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420. Brake Cylinder Leakage With ET Locomotive Brake Equipment.—"Does leakage through the brake cylinder packing leathers have any effect with the ET equipment? If not, why not?"—*J. H. L.*

Answer.—Brake cylinder leakage, up to as much as the pump can supply, will not cause the brake to leak off with the ET equipment. However, this does not mean that it will not have any detrimental effect. If it is excessive it will not only make undue pump labor, with heating and wear, but will also prevent accumulating the high main reservoir pressure necessary to insure a prompt release and quick recharge of the train brakes. This is bad enough on level and ascending grades, where it may cause some brakes to stick, and is dangerous on steep descending grades, as it will prevent a prompt and full recharge of the train brakes.

The value of this feature is, in conjunction with that other one that insures the correct brake cylinder pressure for any given brake pipe reduction and irrespective of whether piston travel is right or not, that where such brake cylinder leakage is too small to have any such detrimental effects as just explained it would yet be great enough to render the engine brakes valueless in service applications with the older brake equipments and of much reduced value in emergency application.

It should be distinctly understood that any brake cylinder leakage should be remedied as soon as possible, also long piston travel, and that excessive leakage should be stopped at once, cutting the leaky brake out, if necessary, until repairs can be made.

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421. Triple Valve Buzzing.—"What causes the new triples to buzz? Is this a disease?"—*J. H. L.*

Answer.—This evidently refers to the K or new freight triple valve and the L or new passenger valve. With these valves in good order they will buzz in service applications, due to brake pipe pressure passing by the check valve and into the brake cylinder. The buzzing is caused by the check valve.

These valves also buzz when recharging, though the later form of the K valve may not always do so, as it cannot when in retarded or extreme release travel position. The buzzing when recharging is caused by the check valve, as in the previous instance, the brake pipe air now passing into the auxiliary reservoir.

However, like the older valve, such buzzing may indicate a leaky emergency valve. If so, it will be indicated by it keeping up as long as the brake pipe pressure is maintained and by the resultant blow or discharge at the exhaust, which will be at the retaining valve if one is had. Hence, it is very easy to distinguish between them.

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422. How Detect Emergency Valve Leakage.—"How can a brake be tested to locate an emergency valve that is tight when the brake is off, but that leaks when it is almost fully applied?"—*A. D. T.*

Answer.—The best method known of is one used on a road that maintains their brakes as well as any and better than the most. The brakes on all cars passing over the repair tracks are tested as follows for this defect: Having stopped *all* brake pipe leakage on the triple valve side of the cut-out cock, using soap suds to make sure of this, the brake is fully applied and the cut-out cock is closed. The release valve or "bleeder" is then opened slightly and held so until the brake starts to release, being then closed promptly. If the emergency valve is tight the brake will continue to release, but if it leaks the brake will stop releasing before it is off.

423. Length of Train Indicated by Brake Pipe Exhaust.—"With the ET equipment can an engineer tell the length of the train pipe by the length of the train line exhaust? Also, what effect do the new triple valves have on this?"—*J. H. L.*

Answer.—The automatic brake valve with either the No. 5 or the No. 6 ET equipment is exactly the same as the older one, or G6, in this particular. Consequently, he can tell near enough to judge as to whether or not the brake pipe is materially shorter than it should be, as where a closed angle cock has cut off a number of brakes. This is due to the fact that the longer the brake pipe the longer and stronger should the service exhaust be for any certain reduction.

While this exhaust will be about one-half as long with a train of K than with one of the older or H triple valves and in proportion with a train of mixed valves, yet *it should remain the same for any certain train.* Therefore, as the brake test will determine how long it should be, this will enable the engineer to detect any later and unintended shortening of the brake pipe.

But an engineer that waits for this indication of an improperly closed angle cock, valuable though it is, is liable to learn of it too late to avoid trouble and is overlooking other indications, as are trainmen also where cabooses have air gauges. The caboose gauge should be watched close enough, requiring little or no trouble, to detect *any* shortage in pressure before it could cause trouble. The observing engineer will watch for such other signs of a too short brake pipe as are indicated by less pump speed to maintain pressure than before noted; "flashing" of the brake valve equalizing piston in releasing brakes; overcharge of brake pipe for proper time, considering length of train, in release position; less loss of main reservoir pressure than should have occurred when releasing; and brakes recharging quicker than they should, as indicated by the air gauge, for the length of train being handled.

424. Brake Shoes Indicating Brake Condition—"How can I tell by the appearance of the brake shoes whether the brake is in good condition or not?"—*J. H. L.*

Answer.—This is a very important question and refers to a test so simple and so generally available as to cause surprise that all railway men are not familiar with it and that so few make any use of it. Where hand brakes are not used it is an unerring indicator as to whether a brake has recently been doing at least fairly good work or little or none. The appearance of the wheel tread should be noted, as well as of that of the shoe.

A good brake has the following effects on the shoes and wheels: First, it roughens the surfaces in contact. The shoe will indicate this by marks of recent wear, and the tread of the wheel by a scratched appearance. If any heavy braking has been done, as is always true of a good driver brake and after a steep descending grade with car brakes, the brake shoes should show the effect of heat on the edges near the wearing surfaces, either a dull black or rusty red and dry, no soft mixture of oil and dust.

With a brake that holds little or not at all the shoes will show no indications of heat and little wear on their faces; in fact, may have dust or oil on their faces. The wheels will show polished treads, easily distinguished from the more or less scratched appearance where brakes hold well.

A driver brake, especially and generally a tender brake, both in particular where the engine has the ET equipment or combined automatic and straight-air, can readily be judged, as to condition, by the appearances just described, though with the combined automatic and straight-air an indication of a good brake may not apply to the automatic feature. In judging car brakes an allowance should be made for the empty weight, on which braking power is based, as light-weight cars should show less indications of shoe heating than heavy cars where their brakes are in equally good condition.

Watch for these signs of good and poor brakes when on engines and when passing cars, and you will gain some valuable knowledge. If your work is on steep grades, occasionally at least, check the appearance of shoes and wheel treads by the temperature of the treads, as judged by feeling, after descent of a grade, bearing in mind that the hottest wheels show the most brake work done.

425. Air Brake Recording Gauge.—"Describe the air brake recording gauge and tell its use?"—*J. H. L.*

Answer.—The air brake recording gauge is, primarily, a device by means of which the engineer makes a written record of how he handles the brakes, though its record shows other details also. It consists of a combined gauge and clock mechanism. The latter turns a paper chart having time and pressure lines printed on it. The gauge hand or arm carries a pen that records the pressure to which the gauge is connected. Usually this is the brake pipe pressure, but it may be auxiliary reservoir, brake cylinder or main reservoir pressures.

When connected to the brake pipe its use is to show the braking done by the engineer, as previously stated, how rapidly the brakes are recharged, how accurately the brake pipe pressure is maintained and whether or not at the standard, and the amount of brake pipe leakage. It will show whether the engineer used release the proper length of time, whether he overcharged, whether he made any "kick-off" movements with the brake valve handle, whether he put the handle on lap a short time before he commenced an application, how much each reduction was and the total of every application, these including leakage, whether he used emergency, and the time when each of the foregoing occurred.

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Train Rules and Train Practice.

Answers by H. A. Dalby.

314. A Bad Combination.—"The stations on this road are as follows:

F	E	D	C	B	A
	Blind siding.		Blind siding.		

"I am on No. 9, superior train, A to F. No. 10 runs from F to A. We received Order No. 1 at A as follows: 'No. 9, meet No. 10 at D.' Order No. 2 received at B as follows: 'No. 9, meet 1st No. 10 at C instead of D.' We also received Order No. 3 at B: 'No. 9, meet 1st No. 10 at C instead of D and 4th No. 10 at E.'

"The conductor claims that the meet with 4th No. 10 is a positive meet that cannot be fulfilled except in this manner: Meet 1st No. 10 at C, go to D and meet 2d and 3d. After meeting them go to telegraph office and ask operator to ask dispatcher if there are more than four sections of No. 10. His reason is this: The dispatcher may have started a fifth No. 10 out of F with Order No. 1 in her possession and 5th No. 10, upon finding 4th No. 10 at E, could let 4th No. 10 precede her to D, as per Rule 94. I claim that the 'meet' with 4th No. 10 as it reads, makes that part of Order No. 3 an improper order; that before leaving B on Order No. 3, we should ask that the words 'instead of D,' be inserted following E, making the entire order read: 'No. 9 meet 1st No. 10 at C instead of D, and 4th No. 10 at E instead of D.' If Order No. 3 was not changed as above, would not I be in the right to stay at D? I think I would, because as Order No. 1, as concerns the meet with 4th No. 10, has not been fulfilled, superseded or annulled. Could not Order No. 3 be put out this way, and supersede Order No. 1 as concerns the meets with 1st and 4th No. 10? 'No. 9 meet 1st No. 10 at C and 4th No. 10 at E instead of D,' or, is it necessary to have the words 'instead of' follow the new meeting point?

"As for 5th No. 10, if the dispatcher lets 5th No. 10 out of F with only Order No. 1, providing Order No. 3 was a proper order, would not it be a good idea for him to start out the wrecker? Or, leaving Order No. 3 as given at first, what would be the proper course to take? What business have I to ask the dispatcher whether there are more than four sections of No. 10?"—*A. L. V.*

Answer.—The situation involves two difficulties which should have been avoided by the dispatcher. The construction of Order No. 3 is a violation of prescribed forms and both Orders 2 and 3 are worded in a way which, if not unrulable, is decidedly injudicious. They may very easily lead to argument if, indeed, nothing worse. The practice of sending an order concerning "No. 10" and then following it with other orders dealing with sections of No. 10, the first order remaining in effect, is unwise if not dangerous. When "No. 10" is mentioned it implies that there is but one train using that schedule. When there are sections each should be specified. Rule 206 indicates it plainly and common practice insists upon it. When it is found that there will be sections of No. 10 all subsequent orders should mention each one separately. The first order should be superseded or annulled. It is true that Rule 218 says that "No. 10" means all sections, and that each must have copies of orders affecting them, but it is easily imaginable that sections may be added, one at a time, while meeting points are being arranged and changed, and either by intention or otherwise the original meeting order fails to reach some particular section or becomes confused in some other way. The principle is bad and may be dangerous. (See Question 309, December number.)

In the case mentioned, No. 9 should refuse Order No. 3 at B unless the words "instead of D," were added. As it stands it simply conflicts with Order No. 1. As to asking the dispatcher at D if there is a 5th No. 10, it would only be justifiable by reason of the inexcusable combination of orders as issued. A proper use of prescribed forms does not require any such question at any time. If the conductor has a reasonable doubt as to the action of a possible 5th section, it would be perfectly proper to take that precaution. With the orders in the shape they were, we are inclined to think the precaution would be warranted.

As to whether 5th No. 10 could take the 4th ahead of it to D if it held only Order No. 1, it is a fair question. It would seem to come within the provisions of the second paragraph of Rule 94 for it certainly has "right or schedule which permits it to proceed." At the same time it is an unwritten law that when a section is held by a meeting order the following section is also held, even though it does not hold a copy of the order. "Good horse sense," of which we sometimes hear, would, we believe, prevent their going to D. The whole thing reverts to the manner of issuing the orders. If that were properly done no question could arise.

As to your proposed order: No, it would not be correct. A supersedure of a meeting point must always contain the words "instead of."

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315. Meets and Waits.—"Leaving A, No. 241 gets this order: 'No. 241 wait at D until 9:50 a. m. for Extra 2546 east.' No. 241 then gets this order at B: 'No. 241 meet Extra 2546 east at E.' No. 241 arrives at D at 9:30. Some claim that owing to the positive meet at E, No. 241 can pass D at 9:30, as the 'meet' supersedes the 'wait.' I contend that No. 241 should wait at D until 9:50, fulfilling the wait order and then proceed to E to fulfill the meet.

"Now, suppose the extra should overlook the meet, or on arrival at E see that they could make D by 9:50 and did so, how would 241 get by E with the positive meet in her possession? Of course 241 met them at D, but she has not fulfilled the meet until she meets the extra at E. D is not a telegraph station in this case. A, B and F are telegraph stations."—*A. L. V.*

Answer.—The only way we can answer this question is to refer to Rule 220, which says that orders once in effect continue so until fulfilled, superseded or annulled. The first order is not superseded by the second and must be either fulfilled or annulled. It is a combination which is out of the ordinary and is not contemplated by any system of train dispatching, so we see nothing to do but obey instructions.

Extra 2546 could, of course, only pass E by disregarding the second order, which is another condition not provided for in the rules. In such a case good sense is all that one has to guide him. If the dispatcher were accessible we should ask for orders making the situation plain. If the conductor and engineman of the extra could be interviewed we should ask them for an explanation. If the train were stopped for this purpose it would, in our opinion, be justifiable. It is a doubtful situation. There are no rules to cover it. There may be a mistake in the order regarding the engine number. Perhaps the second order means Engine 2528 instead of 2526. You have no way of knowing. A dozen possibilities may be involved. It is a case of doubt. Take the safe side and then ask your superintendent if he approves of that method of handling trains. If he does, ask him how he wants you to be governed.

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316. Signals Without Orders.—"A and B are blind sidings, C is a telegraph office. First 242 is at A for No. 4. No. 4 passes and proceeds about two miles, when their engine breaks down. Engine of 1st 242 cuts off and pushes No. 4 to B, another blind siding. They get a spare engine there which takes No. 4 to the terminal. Engine of 1st 242 and the disabled engine take siding at B. Engine of 1st 242 could not return to her train against No. 8 and remained at B. In the meantime we came to A on 2d 242 and found 1st 242's train, but no engine. The only information we had was that the engine went with No. 4. We supposed it would take No. 4 through to the terminal. Our two conductors thought we should proceed as 1st 242, displaying signals to the next open telegraph office, but the engineer of our helper brought up Rule 95 and said we could not display signals without orders from the superintendent. We could not use Rule 94 and exchange orders, for we did not know where engine of 1st 242 was. We finally flagged to C on No. 8. Was this correct?"—*Member.*

Answer.—We think you did the best thing under the circumstances. You could not very well display signals for you did not know as there would be any engine to follow them. If a display of signals were considered best, however, it would not be a case of assuming authority to do so without orders from the superintendent, but would be properly authorized by the first paragraph of Rule 94, 1st 242 being the disabled train and the exchange being made in accordance with that rule. As the matter finally worked out it would seem that you pursued the best course.

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317. Another Doubtful Case.—"We were on Extra 2814 west and received the following order: 'Extra 2814 west meet 1st No. 242 at Willcox.' We were delayed and could not get to Willcox for No. 8. When No. 8 arrived there was a 'flag' on her for 1st 242. Now, after 1st 242 arrived did we have a right to proceed to Willcox against the 2d? We had a positive meet with 1st 242 at Willcox, but she flagged out, and did the 2d have a right to leave Willcox? Some contend that 2d 242 did not know a thing about us, and others say that she had a copy of the order for us to meet 1st 242 at Willcox. Whether they did or not, I am unable to say."—*Member.*

Answer.—Our opinion is that your order is fulfilled in the sense that you have met 1st 242. The only reason you did not meet them at Willcox was that they used a red flag to proceed beyond that station. When you have met the 1st section you must then look out for the 2d. It is entirely possible that the 2d section did not receive the order concerning the 1st section.

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318. Extra North or Work Extra.—"The stations on this road from north to south are as follows:

Coleraine,
Taconite,
Arcturas,
Marble,
Pengilly,
Sillica,
Tivoli,
Elmer,
Meadowland,
Mainey,
Coleraine Junction.

"Order No. 7 was issued as follows: 'Engine 23 will run special Coleraine to Coleraine Junction, and has right over all extras north and will wait at Marble until 8:15 a. m., Pengilly 8:25, Sillica 8:48, and Tivoli 9:08, for all extras north.'

"At Taconite Order No. 11 was received as follows: 'Engine 21 will work extra until 11 a. m., between Marble and Coleraine and will protect against Extra 15 north, and after 9:15 a. m. against Special 23 south, Taconite to Marble."

"Please say in what way Order No. 11 gave engine 21 rights over Special 23 south, Marble to Taconite, until 9:15 a. m., while Order No. 7 gave Special 23 south right over all extras north, and it had not been cancelled or superseded?"—*J. F.*

Answer.—Assuming that you are working under the old Standard Code the situation has the appearance of a lap order. The clause in the work order which requires the work extra to protect against Special 23 south is according to Example (b) under Form H, which reads, "will protect against Extra 223 south between Antwerp and Brussels after 2:10 p. m." This example is explained in these words: "In this case, Extra 223 must not pass the northernmost point before 2:10 p. m., at which time the work extra must be out of the way, or protected (as the order may require) between those points."

This would authorize the work extra to use the main track in either direction without restriction *between Taconite and Marble* until 9:15 a. m., and places no restriction whatever between Coleraine and Taconite. The special is not restricted between the last two points, so it looks as though both had right to the same track at the same time. The only condition under which the order could be legitimate would be in case the special south had already arrived at Taconite when the work extra received its order, and this is not likely.

If you mean to ask how work extra 21 could run north from Marble to Taconite before 9:15 a. m., the work order gave absolute right over the special south until that time, and the special could not leave Taconite until the time had expired. It was not an extra north, it was a work extra and could run in either direction.

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319. Annulling a Section.—"Engines 208, 209, 210 and 211 are running as 1st, 2d, 3d and 4th No. 2 A to D. At C an order is issued to 4th No. 2 as follows: 'Engine 211 is annulled as 4th No. 2 from C.' Does this order annul 4th No. 2 beyond C and would engine 211 need anything on 4th No. 2 to go to D as an extra?"—*F. C.*

Answer.—This is one of the many questions which has come up in connection with Form F of the old Code, and these questions have resulted in the form being completely revised for the new Code. It is one of the points which the old Code does not explain and it can only be ruled upon for any particular road by the proper officers of that road.

The writer has, however, always held that an order given in this manner simply takes schedule No. 2 away from Engine 211. It does not affect the schedule in any way. It simply says that Engine 211 will *not* run as 4th No. 2 from C to D. If the dispatcher finds it necessary he can run some other engine as 4th No. 2, or he could even give Engine 211 orders to again run as that section.

As to whether Engine 211, if running extra, must have an order to run ahead of 4th No. 2, we assume that in this case signals were displayed by the 3d section when leaving C, so that it would be necessary for Extra 211 to have orders to run ahead. According to our understanding, as above indicated, Engine 211 has no information that there is no 4th section of No. 2; all they know is that Engine 211 is not to run as that section. Therefore it must have authority to proceed on the time of the 4th section.

It must be understood that the above is the interpretation of this writer and what seems to him to be the most logical. He is inclined to believe that his deduction is correct from the fact that in the new Standard Code, Form F has been revised in such a way as to authorize the understanding we have given. One of the things which is most misleading in this form is the use of the word "annulled" in connection with a section, as indicated in the question. In fact, it is the very thing which gave rise to the question. In the new Standard Code the word used in this connection is "withdrawn," making the order read "Engine 211 is withdrawn as 4th No. 2 at C." That simply means that Engine 211 is taken off the schedule. The authority for a 4th section is not taken away. Any engine may be ordered to run as that section and other trains must assume that there is such a section if signals have been displayed. According to the new Code, if it is desired to cancel the effect of the signals entirely so that no such section can thereafter be run on that day, an order must be sent under Form K, like this: "4th No. 2 of November 26th is annulled, C to D." Under this form the privilege of running a 4th No. 2 is entirely cut off and other trains may be governed accordingly.

It is to be hoped that the new Form F will be adopted as rapidly as may be, for there is hardly a division on which there is ordinarily heavy traffic where these questions have not been brought up, and, as has been said, they cannot be satisfactorily answered by the old Standard Code. They must be ruled upon by the proper officer.

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320. Temporary Single Track.—"From A to G, south bound, there are two tracks, but they are used as double track only during the summer. When double track is to be put in use it is announced by a circular to all concerned, giving instructions that all unscheduled trains may run without train orders, but must get a clearance at terminals and when entering double tracks. North bound trains use west track and south bound use east track.

"On one occasion it became necessary to use the east track (south bound) between E and F, as single track and a bulletin was issued to all trains to that effect. It was designated as 'Order No. 2,' and was written on regular train order form, and conductors and engineers were required to sign for it. It was as follows: 'All trains in both directions will run via east track between E and F from 7 a. m. until 6 p. m., November 1st.'

"Extra 234 south had left A and received the order at D. When they reached E the engineer stopped and asked for train orders over this piece of single track. He was given the order, but, on asking for instructions after arrival at the terminal, it was ruled by the superintendent that he was not entitled to a running order, as he held a double track clearance reading from A to G. Will you kindly give your opinion as to this decision?"—*A. B. C.*

Answer.—The writer is perfectly willing to give an opinion on any matter pertaining to the movement of trains, but he does so with the understanding that it is his opinion only, and that the officers of the road are at perfect liberty to make such ruling as they see fit.

In this case we think we should have acted exactly as did the engineer and we think it would not be right to censure him for so doing. His action seems perfectly logical, but even if it were not, it was a case where there was a reasonable doubt and he simply took the safe course.

But his position seems entirely logical. The instructions permitting extras to run without orders were because the track was double, and only because of this. When one track was temporarily abandoned it made a single track of the other one, even though it did not say so in those words. That is what it meant and no other construction could be placed upon it. On single track one would naturally suppose that single track rules would govern. The clearance held by Extra 234, which was given to it at A, was authorized solely by virtue of the fact that double track was in use and such clearance is used only when both tracks are in service. It is a double track provision. Between E and F it was, for the time being, single track.

To sum up, therefore, when double track is in use extras may proceed on a clearance without running orders. Between two certain stations one track is closed and the other is used as single track. No instructions had been issued for such contingency. The engineer was left to his own judgment and he assumed that on single track he should have an order to run. At any rate this looked like the most logical conclusion and he had no way of knowing how the dispatcher and trains in the other direction would regard the matter. He asked for orders and we think he was right.

As to the decision of the superintendent, which is authority for future action, we think we should have ruled otherwise, but that is his business and not ours.

American Railway Association.—The writer has been asked if he is a member of the American Railway Association. No, he is not. The association is not composed of individuals, but of railroad companies, and its business is transacted by the operating officers of the roads holding membership. In its meetings, which are held at some convenient point in April and October of each year, each road holding membership is entitled to one voting representative for each thousand miles of main track operated.

While the association has done much work which is of value to American railroads, the part of its labors which is of greatest interest to those in the transportation department is the formation of the Standard Code of Train Rules. This was completed in its original form in April, 1887, but has been under continual revision since that time, so that the last edition (April, 1906), is not only quite different from the original, but is a vast improvement over it. A review of the different editions, each better than the one before it, is very interesting.

The original Code included only rules for single track, but additions have been gradually made so that the revision of 1906 contains not only these but rules for double track and rules for three and four tracks. There are also rules for the movement of trains with the current of traffic on double track by means of block signals, and for movement against the current of traffic by block signals. This volume may be obtained from the secretary of the association, 24 Park Place, New York, for 50 cents, and is well worth the price to all in this department of the service.

The rules as set forth in the Standard Code are only recommended and there is nothing obligatory on any road to adopt them, either in whole or in part. They are in use on almost every road, but with more or less variation. Rarely, if ever, are they adopted as a whole. Indeed it is intended that each road shall make such additions or modifications as will suit its own conditions.

It is safe to say that the present edition is the best code of rules that has yet been devised, and although a slight modification may be necessary in order to apply to the individual road, there can be no better basis on which to work, and by adopting them there is the added advantage of uniformity, they being practically the same on all roads using them.

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*The Methods of Handling a German Locomotive**

A short paper on "The Fastest Train in Prussia," by Dr. W. F. M. Goss, dean of the College of Engineering at the University of Illinois, is published in "The Technograph" (issued by the university). This gives an interesting description of the methods of operating the locomotive, as compared with American practice.

The train in question runs from Berlin to Halle, 102 miles, in 110 minutes, making no intermediate stop. The train when seen by Dr. Goss had cars aggregating 40 axles carrying approximately 8 tons each, or 320 tons in all. The locomotive was a single-expansion engine of the 4:4:0 class, with large driving wheels, piston valves, Walschaerts valve gear and the Schmidt superheater. The handling of the engine is described by Dr. Goss as follows:

"The signal is given. With both hands the engineman pulls down on his throttle lever, which moves in a vertical plane, until it is more than half way open. Now that the engine is starting, he gives the throttle no further attention, but stands with his hands on the reverse-wheel, watching the struggle of the locomotive for mastery over its train. When the drivers slip, he catches them with a quick turn of the reverse-wheel before they have made a single revolution. If they hold well he slowly turns reverse-wheel to lengthen cut-off.

"Under similar conditions the engineman of an American locomotive would have had his hand upon the throttle lever, opening and closing it as the adhesion of the wheel might require. If it were suggested to him that the throttle be left well open, and that the output of power be controlled by means of the reverse lever, he would probably smile and tell you that the reverse lever is too clumsy a device to serve in giving the delicate gradations of power needed. But here stands the German at a screw-driven reverse gear (which has always been regarded by Americans as too slow and laborious for successful use) feeling with a sensitiveness of touch which is fine, the adhesion of drivers upon the rail, and with one hand and little effort holding his engine to the hardest work it is capable of doing.

"High up upon the side of the cab is a speed indicator, which shows the engineman at a glance the rate at which he is running. In front of him, besides the usual boiler gage, is another gage, which gives the pressure of steam in the valve-box. The maximum boiler pressure is 180 pounds, and it is explained that the purpose of the engineman is to keep the valve-box pressure approximately 150 pounds. As the speed increases he adjusts, by small increments, first the cut-off and then the throttle until the output of power and the conditions of pressure are to his liking. Another dial before him is that of a thermometer indicating the temperature of the steam in the valve-box. This at the instant of starting was but little above 400° F., but has since risen steadily. It is desirable that it should not go above 660° F. By the time we are at speed it has passed the 500° mark, and the engineman, crossing over to the fireman's side, turns a wheel attached to a light shaft running forward over the boiler. This partially closes the damper and thereby diminishes the flow of furnace gases through the superheater.

"At the crossing of the Elbe, 63 miles from Berlin, for the first time during the run the throttle was closed and the brakes applied for a slow at the bridge. The engineer of an American locomotive, after closing the throttle, must move the reverse lever to its extreme position on the quadrant in order that the compression effects in the cylinders may be reduced. But our engineman does nothing of the sort. He allows his reverse gear to stand in running position, but pulls a handle which opens a valve in a by-pass connecting the two ends of the cylinder. This open by-pass affords relief from the compression that would otherwise occur.

"Toward the close of our journey we were running ahead of our schedule and were several times required to slow on signal, notwithstanding which fact we were at Halle two minutes before we were due."

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*From Engineering News.

Railway Club Proceedings

*Railway Electrification Questionnaire.**

ELECTRIFICATION—
  Why it is being done:
    To increase capacity.
    To improve service.
    To reduce operating expense.
ELECTRIFICATION—
  Where it is being done:
    New York Central and other third rail installations.
    New York, New Haven and Hartford and other single phase installations.
    Valtellina Line and other three phase installations.
ELECTRIFICATION—
  How it is being done:
    With direct current motor.
    With single phase motor.
    With three phase motor.

Electrification—Why It Is Being Done.

1—Question. Can the electric locomotive do for a dollar what the steam locomotive does for two?

Answer. There are enthusiasts who maintain that an electric locomotive can do for a dollar what a steam locomotive does for two. There are moderates who believe that dollar for dollar is the ratio. There are pessimists who do not believe that the electric locomotive can do as much for a dollar as a steam locomotive can do for the same amount. However, as has frequently been pointed out, the primary object of electrification is not to reduce operating expenses, but to improve the service and increase the capacity. Mr. McHenry, Vice-President of the New York, New Haven & Hartford Railroad, says that under general conditions it is altogether improbable that the saving resulting from the simple substitution of electric for steam power will be sufficient to justify the additional investment and financial risk.

2—Q. Is it the opinion of railway men that steam roads are reaching the limits of their capacity?

A. Yes. According to Mr. J. J. Hill's estimate of a year ago, 75,000 miles of new track were then needed to relieve the traffic congestion. Mr. Harriman has gone on record to the effect that an increase of capacity is a vital necessity, that electrification is the solution, and that the increase in capacity resulting from electrification will be accompanied by a great saving. Mr. Brown, Vice-President, New York Central, believes that at the country's present rate of growth it will be necessary to spend as much towards increasing capacity of the present railways during the next ten years as has been spent in creating these railways. With reference to the present shrinkage of business Mr. Delano, President of the Wabash, says he believes the low water mark has been reached, and that the business of the country will improve from now on.

3—Q. In what parts of the system are the limits of the capacity of the steam service first reached?

A. The limits are first reached in terminals, on heavy grades, and in tunnels.

4—Q. Assuming that terminals, grades, and tunnels have in certain cases reached the limits of their capacity under existing steam conditions, is it also true that the steam locomotive has reached the limits of its capacity?

A. There are those who believe that the steam locomotive has reached its limits as a commercial machine. It is doubtful whether the additional weight incident to increase in boiler capacity and the additional refinement incident to mechanical stoking, feed water heating, superheating, and compounding can justify themselves. This straining of steam locomotive design to get increased capacity merely produces a machine of half the maximum capacity easily attained in electric locomotive design. "The Railway Age" states that the steam locomotive has pretty nearly reached the limit of its power development.

5—Q. Assuming the steam locomotive to have reached its limits of draw bar pull and speed, and assuming a case where the terminals and tracks equipped with block signals have reached the limits of their capacity under steam conditions, what then are the alternatives?

A. The alternatives when steam conditions have reached their limits are to enlarge the terminals and lay down additional tracks or replace steam locomotives with electric locomotives that can handle heavier trains and at the same time increase the schedule speed. The cost of the new tracks and the cost of the terminal extensions, however, may easily exceed the cost of the electrification that will give an equal increase in capacity.

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*By H. L. Kirker, Resident Engineer, Westinghouse Electric Manufacturing Company, St. Clair Tunnel.

6—Q. The electric locomotive then can give a heavier pull at high speed than the steam locomotive can give?

A. Yes. The electric locomotive is a more powerful high speed machine than the steam locomotive. It is essentially a driving mechanism, fed from a central station of many times the capacity required to handle the train. The elimination of the generating plant from the locomotive makes room for a bigger prime mover and allows the weights to be so disposed as to increase the adhesion. The outside source of supply means that the motor can give a powerful pull through its entire range of speed. The steam locomotive is an isolated power station whose capacity is limited by the area of the heating surface of its boilers. It can exert a powerful pull at slow speed, but (to quote Mr. McHenry again) "there are few locomotives that can generate sufficient steam to use their full cylinder capacity at speeds in excess of twelve miles per hour." He adds that "an increase in speed beyond certain limits can only be attained by decrease in tonnage of train. The high cost of fast freight service is due to this."

7—Q. What is regarded as a maximum capacity steam locomotive?

A. The Mallet articulated compound built for the Baltimore & Ohio Railroad is one of the biggest steam locomotives ever built. It weighs 167 tons without tender. All the weight is on the drivers. It has a continuous capacity of 71,500 pounds draw bar pull at 10 miles per hour (7,900 horse power). A more recent Mallet, built for the Erie, for mountain service weighs 205 tons, has 16 drivers, and can give a draw bar pull of 94,800 pounds, working simple. A maximum power Pacific type freight engine weighs 109 tons, exclusive of tender. Sixty-seven tons of this weight are on the drivers. The locomotive has a continuous capacity of 33,500 pounds draw bar pull at 18 miles per hour (1,600 horse power). A recent maximum type Pacific passenger engine has 86 tons on the drivers and can develop a draw bar pull of 32,000 pounds. A maximum power compound Atlantic type locomotive weighs 100 tons without tender. Fifty-five tons of this weight are on the drivers. The engine has a continuous capacity of 20,500 pounds draw bar pull at 25 miles per hour (1,360 horse power). A maximum power Consolidation locomotive weighs 96.5 tons without tender. Eighty-five tons of this weight are on the drivers. The locomotive has a continuous capacity of 42,500 pounds draw bar pull at 9 miles per hour (1,020 horse power). The most powerful simple freight engine built in 1907 has a draw bar pull of 60,000 pounds.

8—Q. How do some of the typical electric locomotives compare with these maximum capacity steam locomotives?

A. The New York Central direct current third rail passenger locomotive weighs 95 tons. Of this weight 70 tons are on the drivers. It has a nominal capacity of 2,200 horse power at 40 miles per hour. Its maximum capacity is 3,000 horse power. It can give a maximum draw bar pull of 34,000 pounds before slipping its wheels.

The New York, New Haven & Hartford single phase passenger locomotive weighs 85 tons. All the weight is on the drivers. Its nominal capacity is 1,000 horse power, its maximum capacity is 2,000 horse power. It can give a draw bar pull of 22,000 pounds.

The St. Clair Tunnel single phase freight locomotive (double header) weighs 125 tons. All the weight is on the drivers. The locomotive has a nominal rating of 1,500 horse power. It can haul a 1,000 ton train up a 2 per cent. grade at 10 miles per hour. It can give a draw bar pull of 80,000 pounds before slipping its wheels.

The 15 cycle experimental single phase locomotive (double header) made for the Pennsylvania Railway weighs 140 tons. One hundred tons of this weight are on the drivers. The locomotive has a continuous capacity of 9,200 pounds draw bar pull at 61 miles per hour (1,500 horse power) and one hour capacity 14,700 pounds draw bar pull at 51 miles per hour (2,000 horse power) a maximum draw bar pull of 48,000 pounds and maximum capacity of 3,000 horse power. The three phase locomotive of the Italian State Railways weighs 95 tons. All of the weight is on the drivers. The nominal rating of the locomotive is 2,250 horse power. The maximum draw bar pull is 47,500 pounds. Mr. Armstrong says that the great claim for recognition of the electric locomotive lies in its great horse power output, its ability to carry full tractive effort, or slip its wheels at speeds two or three times greater than can be done with any steam locomotive yet built. Four motor equipments can be built to deliver a draw bar pull of 56,800 pounds at 23 miles per hour (3,500 horse power). Two of these trucks combined into one engine could give a draw bar pull of 113,600 pounds at speed of 23 miles per hour (7,000 horse power). The various independent locomotive units can be articulated to give practically unlimited power. The several articulated units can be handled by multiple control as a single unit.

9—Q. Admitting that the electric locomotive is a more powerful machine than the steam locomotive is it also true that it is a simpler machine than the steam locomotive?

A. Yes. The electric locomotive is a simpler machine than the steam locomotive. The motors are simpler than the steam engines they replace. The motor auxiliary apparatus consists of current collecting and current controlling devices. These accessories are insignificant in comparison with the generating plant of the steam locomotive. The manipulation of these electrical accessories is concentrated in a master controller.

10—Q. Admitting that the electric locomotive is a more powerful machine and a simpler machine than the steam locomotive, is it also true that the electric locomotive is the more economical of the two locomotives?

A. Yes. The electric locomotive is more economical than the steam locomotive. Assuming that the steam locomotive consumes four pounds of coal per horse power hour, and that the modern central station can deliver a horse power hour to the dynamo for two pounds of coal, and assuming further that the addition of an electrical system to the central station only adds 5 per cent. to the total thermal losses, it follows that the electric locomotive can deliver a horse power hour to the draw bar with approximately half the coal consumption of the steam locomotive doing the same work. Moreover, the electric locomotive consumes no power when idle, nor when coasting. Not only is the electric locomotive more economical of power than the steam locomotive, but its maintenance is less. Taking the locomotive mileage for 1907 as 1,300,000,000 miles, and cost of repairs and renewals as $104,000,000, the locomotive maintenance was 8c per locomotive mile. The figure for 1904 was 8.1c. According to such authorities as Mr. Stillwell and Mr. Armstrong, the maintenance of the electric locomotive need not exceed 5c per locomotive mile. This is an instance of an important contract that contains the guarantee that the maintenance of the electric equipment of the locomotive shall not exceed 4c per locomotive mile.

11—Q. Admitting that the electric locomotive is more powerful, simpler, and more economical than the steam locomotive, is it not true that it is helpless in case of failure of power supply?

A. Yes. A complete failure of the power system could tie up the electric zone. However, the possibility of such a contingency is remote. The reliability of the power station and the reliability of the transmission system is based on twenty years' experience. Each power station has reserve units, and the various power stations are inter-connected. The transmission lines are in duplicate. Repairs can be rapidly effected. Traffic can be shunted around local trouble as in steam service. The reserve units in the power stations, the inter-connection of stations, and the duplication of the transmission systems practically eliminate the hazard of a complete stoppage of traffic due to failure of power. A destruction of the track due to such causes as wrecks and floods would carry away the third rail, and the third rail would interfere with repairs. However, the overhead trolley would practically render the power supply system independent of the permanent way.

12—Q. Admitting the electric locomotive to have greater capacity, simplicity, and economy than the steam locomotive, and assuming the transmission system and power station to be entirely reliable, is it not a fact that the first cost of the electrical equipment is about ten times that of the steam equipment?

A. In the discussion of the subject of electrification it is frequently assumed by railroad men that a steam locomotive costs $10 per horse power, and that the electrical equipment costs $100 per horse power ($15 per horse power for the electric locomotive and $85 per horse power for the power station and the transmission system).

13—Q. But should not coal chutes, water tanks, cinder pits, boiler shops, and a part of the machine shops be charged up to the steam locomotive?

A. Yes. They are as much a part of the steam locomotive equipment as the power house and transmission system are a part of the electric locomotive equipment. These steam accessories would have to be scrapped in a completely electrified division.

14—Q. But is it any more necessary for the railway company to own the power plant than it is for it to own a coal mine?

A. No. There will be power companies as there are coal companies. It will be possible to buy power delivered to the trolley just as it is possible to buy coal delivered to the sidings.

15—Q. How does the cost of a horse power hour at the draw bar of an electric locomotive compare with the cost of a horse power hour at the draw bar of a steam locomotive?

A. For equal work done the cost of current is greater than the cost of locomotive coal. However, according to Mr. Armstrong, the operating expense under typical conditions for 1,000 ton miles up and down a 2 per cent. grade is $1.39 for the steam locomotive and $1.02 for the electric locomotive. The cost in the case of the steam locomotive is made up of coal, crew, maintenance. In the case of the electric locomotive it is made up of current, crew, maintenance.

16—Q. Assuming the cost of operation of the electric locomotive to be less than the cost of operation of steam locomotive, is it also true that a given horse power of electric locomotive will do more work in a year than an equal horse power of steam locomotive?

A. Yes. The electric locomotive is in service more hours per day than the steam locomotive. It is in service more days per year than the steam locomotive. There is no turning, coaling, watering, cleaning of fires, boiler washing. In the aggregate the steam locomotive makes 80 miles per day. The freight locomotive will average 6 hours per day on the road. Selected figures show better results. According to the American Master Mechanics' Report (Transactions 1905) on 2,620 locomotives distributed among 22 roads, the engines averaged 20 per cent. of their time in the roundhouse, 33 per cent. of their time awaiting orders to go on the road and 47 per cent. of their time actually on the road. The more common assumption is that the time in the roundhouse exceeds 30 per cent. This is instanced in the following quotation from "The Railway Age:" "If we consider the average run of a (steam) locomotive consumes 10 hours, and that a 5-hour lay-over is customary at the roundhouse, we see that one-third of the time is not available for earning dividends, and the motive power of the railroad is practically reduced by 33 per cent.—exclusive of engines that are in the shop." The increased availability of the electric locomotive, coupled with its high speed and heavy tractive effort characteristics mean that the electric locomotive can handle more ton miles per year than an equal horse power of steam locomotive can handle. Messrs. Stillwell and Putnam believe that the ratio of electric locomotives to steam locomotives for a given service will not exceed 2 to 3, and will probably approximate 1 to 2.

17—Q. Admitting that electrification will increase the capacity of a congested portion of the line, a heavy grade division for instance, how much of an increase can be reasonably expected?

A. Taking the normal steam service on a 2 per cent. grade to be 500 ton trains at 10 miles per hour, it is a simple matter to replace the steam locomotives with electric locomotives that can haul a 1,000 ton train up a 2 per cent. grade at 20 miles per hour. This does not necessarily mean that the electric locomotive unit will be four times as powerful as the steam unit. It can be. It is more probable, however, that the electric unit will be a 1,500 horse power or 2,000 horse power engine, and that these units will be articulated to give the required power. The articulated units will be controlled as one unit from one master controller.

18.—Q. What effect has electrification on the capacity of terminals?

A. Speaking of London terminal conditions, Mr. Dawson says: "The use of electricity, taking into consideration the small proportion of long distance trains to local ones, will practically result in doubling not only the average speed of local trains, but also in doubling the carrying capacity of existing lines and terminals." Mr. Sprague, speaking of American city terminal conditions, says: "As a net result it may be safely stated that so far as the train movements are concerned, the capacity of the yards, over and above that required for the storage of cars alone, can be trebled as compared with steam locomotive-drawn trains. In addition (smoke being eliminated), the yards can be roofed over and the space (overhead) utilized for streets, parks, and buildings."

19—Q. Admitting that electrification is a cheaper alternative than laying new tracks on grades, building new tunnels, and enlarging terminals, is it the only alternative so far as main line work is concerned?

A. No. The addition of a block signal system on the miles of line not yet so equipped will increase the capacity of the railway system, and will do it much cheaper of course than electrification can do it. Mr. W. N. Smith points out that while double tracking increases the capacity fourfold, there is plenty of room for increasing the capacity of existing roads by equipping single track roads with block signals, since but 17 per cent. of the single track roads in the United States are protected with block signals, and single track roads constitute 70 per cent. of the total mileage. He admits, of course, that electrification will increase the capacity of roads already equipped with block signals.

20—Q. Notwithstanding the fact that electrification increases capacity, reduces operating expenses, and improves service, is it not true that in general the existing electrifications have been forced on the railways?

A. Yes. In some cases tunnels, for instance, it has been brought about by legislation. In other instances, such as subways and terminals, the smoke nuisance has forced the issue. So far as suburban lines are concerned, street car competition has been the agent. The Long Island Railway and the West Jersey & Sea Shore Railroad are, perhaps, the most conspicuous instances of voluntary electrification.

21.—Q. Even granting that one electric locomotive can do the work of two steam locomotives, and that the maintenance of the electric locomotive is half that of the steam, does it follow that a general electrification of the American railway system would result in an electric locomotive doing as much for a dollar as the steam locomotive does for two?

A. No. The functions of a locomotive in an industrial community, like that of America, is to pay dividends, but it cannot pay dividends until it has paid the operating expenses and the fixed charges of the railway system. If there is anything left of the revenues after paying the operating expenses (maintenance of way and structures, maintenance of equipment, conducting transportations, and general expense) and paying the fixed charges (interest on funded debt, interest on floating debt, rentals, taxes and sinking fund), why, the remainder (the net earnings) is applicable to dividends. Now, according to the estimate of Messrs. Stillwell and Putnam, if all the railways of the United States were operated by electric power instead of steam, the aggregate cost of operation which in 1905 was $1,400,000,000.00, would have been $1,150,000,000.00. That is to say, the cost of electric operation would have been 82 per cent. of the cost of steam operation. This saving of $250,000,000.00 (18 per cent. of cost of steam operation) would not only have paid the fixed charges on the electric investment, but would have increased the net earnings. The conclusion, then, is that the ratio of the operating expenses and fixed charges of an electric system to the operating expenses and fixed charges of an equivalent steam service is nearer 1 to 1 than 1 to 2. The discussion is academic. Such a thing as the possibility of a general electrification is not even intimated. The general conclusion, however, is irresistible—electrification is the means of increasing the capacity of a congested railroad division.

Electrification—Where It Is Being Done.
Third Rail.

22—Q. Admitting for the sake of argument that electrification will increase capacity, improve service, and reduce operating expenses, do concrete instances of electrification justify these conclusions?

A. Yes. Take the case of the Mersey Railway, a short main line road connecting Liverpool (England) with Birkenhead. It is a tunnel road. It was electrified to eliminate smoke and meet ferry competition. The traffic is almost exclusively passenger. The system is direct current third rail 650 volt, with multiple unit trains. The electric service was substituted for the steam service May, 1903. Mr. Dawson points out that a comparison of the electric service with the steam shows that the train mileage in 1901 (steam) was 311,000 miles, while in 1906 (electric) the train mileage was 829,000 miles. The locomotive charges per train mile in 1901 (steam) were 13.65 pence (approximately 27.3 cents), while in 1906 the locomotive charges per train mile were 5.95 pence (approximately 11.9 cents). The locomotive charges include power, locomotive wages, locomotive maintenance and repairs, and office expense. This increase in train mileage was effected by the increased schedule speed and the increased train frequency. This livening of the service enabled the weight of the train to be cut down to about one-half that of the steam trains. As a net result, this augmentation in service has been effected with an increase of 10 per cent. in the total operating expense. The smoke of course has been eliminated and the traffic is increasing.

23—Q. Is the Mersey the only instance in England of the application of direct current third rail system to a steam road?

A. No. The North Eastern has electrified the line between Newcastle and Tynemouth. The Lancaster and Yorkshire has electrified the line between Liverpool and Southport. The "District" in London has been completely electrified. The Metropolitan (underground) has electrified all of its London lines. The direct current third rail system is used in each instance. In the case of the North Eastern the change was made to meet tramway competition. Here the cost per locomotive mile has fallen from 14.5 pence (steam), to 6.75 pence (electric). The L. & Y. electrification was necessitated by tramway competition. The accelerated service resulting from electrification has had the desired effect. The District and the Metropolitan were electrified to augment their revenues by increasing the capacity of the system and improving the service. The increase in capacity and the improvement in the service has been realized, but the physical conditions are so extraordinary that a marked increase in the net earnings is not as yet being realized. However, confidence in the ultimate result is manifested by the work of consolidation, and extensions of electrification that these lines are carrying out.

24—Q. Is the third rail direct current system in use on the continent of Europe?

A. Yes, but is mainly confined to subway lines such as the Metropolitan of Paris, and the elevated roads like the Berlin Overhead. The third rail line between Milan Galarate and Porto Ceresio in Italy is the most important installation of its kind in Europe.

25—Q. Is the third rail direct current system extensively used in America?

A. Yes. It is in use on the elevated roads such as those in Boston, New York, Philadelphia and Chicago. It is in use on more than 40,000 miles of light railways (interurban service). It is doing heavy railway work on the Lackawanna & Wyoming Valley R. R., connecting Scranton and Wilkes Barre, Pa.; on 97½ miles of the Long Island Railroad; on the West Shore Railroad between Utica and Syracuse (New York); on the West Jersey and Sea Shore Railroad connecting Camden and Atlantic City—65 miles, double track; and on the New York Central (Electric Zone). There are other instances, but these are representative.

•26—Q. How about the most conspicuous example of the application of the third rail system of heavy railway work—the New York Central electrification.

A. The electrical equipment of the New York Central consists of 35 electric locomotives, 131 motor cars and 55 trailers. The service was inaugurated December, 1906. The locomotives are equipped with 600 volt motors. The nominal capacity of the locomotive is 2,200 horse power, the maximum capacity 3,000 horse power. Vice-President Wilgus, who had charge of the electrification, said recently that the maintenance of the electric locomotives is so much less than that of the steam locomotives and that the amount of the time spent in the shops by the electric locomotives is so much less than that spent in the shops by the steam locomotives, that the saving neutralizes the interest charge and the depreciation charge of the additional investment; and moreover, shows a net saving in repairs and fixed charges over steam equipment of 19 per cent. Mr. Wilgus stated further that a comparison of the light repairs and inspection of the electric locomotive with the coaling, watering, drawing fires, repairs, etc., of the steam locomotives shows a saving in time in favor of the electric locomotive of over four hours per day—a saving equal to 18 per cent. He says the electric locomotive is a more nimble and a more efficient machine than the steam locomotive—that it has increased the daily ton mileage 25 per cent. He added that the increased current consumption per ton mile for high speed service is 18 per cent., while a corresponding increase in speed with steam service would run up the coal consumption 165 per cent. per ton mile.

27—Q. Is the third rail direct current system as applicable to long distance heavy railway work as it is to the short haul?

A. No. The low voltage of the direct current motor seriously handicaps the application of this system to heavy long haul work. The normal pressure of the direct current railway motor is 600 volts. This means heavy currents for heavy power. Heavy currents mean a third rail, since the overhead trolley cannot handle heavy current. The third rail of course is not a desirable adjunct to the permanent way. Now heavy current cannot be transmitted economically more than a few thousand feet. This means that there must be substations at frequent intervals along the line. These substations draw high voltage alternating current from the transmission line and deliver low voltage direct current to the third rail. The change from alternating current to direct means moving machinery. Moving machinery requires attendants. Consequently the application of the low voltage direct current to long distance heavy railway work is handicapped by the physical objection to the third rail and the financial objection of the expense due to substation and feeder investment and the expense of substation crews. The advent of the 1,200 volt direct current railway motor will diminish the number of substations, but even with this voltage the current required for heavy freight service will be too heavy for the overhead trolley. The third rail cannot be insulated to stand this voltage. Consequently the 1,200 volt direct current can hardly be applied to extremely heavy railway work.

SINGLE PHASE.

28—Q. Admitting the commercial success of the direct current motor in street railway work, light railway work, heavy terminal work, and admitting its limitations in main line work, can the direct current series motor be modified so as to work on alternating current and thereby eliminate the rotary converter substations and at the same time substitute a high voltage trolley for a low voltage third rail?

A. Yes. Improvement in design has brought out a series railway motor that will work on single phase current.

29—Q. Is the single phase railway motor being applied to heavy railway work?

A. Yes. It is in use on the New York, New Haven & Hartford Railroad between the Grand Central Station, New York, and Stamford, Conn., a distance of 34 miles. Twelve miles of this distance lie in the New York Central third rail zone. The remaining twenty-two miles are equipped with single phase trolley. There are no substations in the single phase system. Alternating current is fed into the trolley at 11,000 volts from the Cos Cob power station. There are 35 locomotives. They operate on direct current in the New York Central zone (12 miles) and on single phase alternating current the rest of the distance (22 miles). The locomotive weighs 85 tons (all on the drivers), and has a nominal capacity of 1,000 horse power and a maximum capacity of 2,000 horse power. The locomotive can handle a 200 ton train at a schedule speed of 26 miles per hour, with stops every 2.2 miles. It can attain a speed of 65 miles per hour with the same train, and can maintain a speed of 60 miles per hour on long runs with a 250 ton train. Heavier trains can be handled by coupling two or more locomotives and operating them as single units. The service was inaugurated July 24, 1907. Notwithstanding the handicap of a double set of auxiliary apparatus on the locomotive, incident to the use of direct current on one part of the line and alternating current on the other, the single phase motor is demonstrating that it can handle long distance heavy railway work. The railway company has within the last few weeks ordered six more of these locomotives.

30.—Q. Is the single phase railway motor in use on other roads?

A. Yes. It is in use on the Rochester division of the Erie Road. The electrified section is 34 miles long. Overhead trolley is used. The current comes from the Niagara Falls (approximately 90 miles). There is a single transformer substation. This substation reduces the transmission line pressure from 60,000 volts to a trolley pressure of 11,000 volts. The auto transformer on the car takes current from the trolley at 11,000 volts, and delivers it to the motors at 220 volts. The service was inaugurated in June, 1907. The single phase motor is in use on the Spokane and Inland Railway. The system involves 106 miles of track.

There are fifteen transformer substations. They reduce the line voltage from 45,000 volts to a single phase trolley pressure of 6,600 volts. However, within the city limits of Spokane, the motors run on direct current. The equipment includes six freight locomotives, each equipped with four 150 horse power motors, six freight cars, each equipped with four 100 horse power motors, and fifteen passenger cars, each of which is equipped with four 100 horse power motors.

31—Q. Has the single phase locomotive been applied to heavy freight service?

A. Yes. The St. Clair Tunnel installation is a conspicuous example of the application of the electric locomotive to heavy freight service. The tunnel involves two grades, each of which is 2 per cent. and approximately a mile long. The locomotive (double header) weighs 125 tons (all on the drivers). It has a nominal capacity of 1,500 horse power, and can haul a 1,000 ton train up a 2 per cent. grade at 10 miles per hour. It can give a draw bar pull of 80,000 pounds before slipping its drivers. Each half unit can be used as an independent locomotive. Current is supplied from an overhead trolley at 3,300 volts. The change over from steam service to electric is now being made.

32—Q. Is the single phase motor also used for light railway work?

A. Yes. It is in use on the Indianapolis & Cincinnati Traction Company Lines. The initial service was inaugurated December, 1904. This was the beginning of single phase railway work in America. It is in use on the Warren (Pa.) and Jamestown (New York) street railway lines. Also in the Napa Valley, California. It is in use on the Pittsburg & Butler Railway, a 39-mile line connecting Pittsburg and Butler, Pa. The equipment involves 18 passenger cars, each equipped with four 100 horse power motors. A single generating station supplies the power. The transmission pressure is 22,000 volts. Two transformer substations reduce the 22,000 volt line pressure to 3,300 volt trolley pressure. Within the city limits of Pittsburg the motors operate on 600 volt direct current. There are other roads. The magnitude of the application of the single phase railway motors is instanced by the fact that one American company alone has built 60 single phase locomotives and 2,000 single phase railway motors—representing the electrification of 1,000 miles of track.

33—Q. Is the single phase railway motor being applied to heavy railway work in England?

A. Yes. The London, Brighton & South Coast Railway is making an initial installation of the single phase system on its London suburban lines. The Midland Railway is equipping an experimental line with the single phase system.

34—Q. Is the single phase system being applied to heavy railway work on the Continent?

A. Yes. The action of the Swedish government is significant. There are 375,000 horse power available in waterfalls in Sweden. Fuel is dear. The government, consequently, is anxious to apply this power to the railways. It equipped an experimental line with single phase locomotives. As a result of the tests the government has decided to proceed with railway electrification. The initial equipment will involve 1,300 miles of track and 385 single phase locomotives. The Swiss government has equipped an experimental single phase line near Zurich. As a result of the tests the single phase system will probably be applied to the St. Gothard Tunnel Line. In Germany the Prussian government will use the single phase system on the Eifel Bahn, a double track line, connecting Cologne and Treves, a distance of 112 miles. The substitution of the single phase system is also contemplated on the Berlin Ring Railway. The Vienna-Baden interurban line in Austria is one of the largest single phase lines in Europe. It is 17.8 miles long. The equipment involves 14 motor cars, each of which is equipped with four single phase motors of 40 horse power each. The Brembana Valley Railway is the most important single phase line in Italy. It is 16 miles long and involves 5 locomotives of 300 horse power each. The Roma-Civita-Costellena line (Roman suburban) is another single phase road. The use of the single phase motor is also contemplated for heavy railway work in Italy.

THREE PHASE.

35—Q. Admitting that the direct current railway motor is a commercial success for short hauls, and admitting that the single phase railway motor extends the range of electrification to main line work, is it also true that the three phase railway motor is adapted to long distance heavy railway work?

A. Yes. The conspicuous example of the application of the three phase locomotive to railway work is the Valtellina line in Italy. The electrified portion is 66 miles long. The transmission pressure is 40,000 volts, the trolley pressure is 3,000 volts. Two overhead trolleys and the track constitute the three circuits. The two trolley wires of course are not only insulated from the rail, but from each other. The original equipment consisted of five 70 ton locomotives and 10 motor cars. Two of the locomotives have been transferred to the Simplon Tunnel, and replaced by locomotives of later design. The later locomotives are equipped with two motors, one of which is 1,200 horse power and the other 1,500 horse power. The locomotive has three speeds of 40, 26 and 16 miles per hour. The system has been in operation five years. Its success has been pronounced. The government is arranging to equip an additional 60 miles of the road with three phase locomotives.

36—Q. Is the Valtellina line the only instance of the application of the three phase system to railway work in Italy?

A. No. The Simplon Tunnel service is performed with three phase locomotives. The electrified section is 12.5 miles long. As is customary with the three phase systems, two trolley wires and the track constitute the three circuits. Fifteen cycle 3,300 volt current is used. The locomotives weigh 62 tons, 42 tons of which are on the drivers. Their rating is 780 horse power. They have two speeds, 42 and 21 miles per hour. The draw bar pull at the lower speed is 12,000 pounds, and at the higher speed 7,000 pounds. They handle 400 ton passenger trains and 500 ton freight trains. The service involves 1 per cent. grade. The electrification is to be extended 12 miles, and later will probably be carried to Milan.

37—Q. Are further extension of the three phase systems to be used in Italy?

A. Yes. The Italian government has entered on a program that involves the electrification of 12 trunk line divisions, representing approximately 200 miles of line. More than half of this will be three phase. The most of the divisions in question are mountain passages that involve heavy grades and frequent tunnels.

38.—Q. Is the three phase system being applied to railway work in other countries in Europe?

A. Yes. It is to be applied to the Alberg Line in Switzerland—the connecting link in the trunk line between Paris and Vienna.

39—Q. Is the three phase system being tried on English railways?

A. No.

40—Q. Is the three phase system being applied to any of the American railways?

A. Yes. Three phase locomotives are to be used in the Great Northern's Cascade Tunnel in Washington. Here the object is to eliminate smoke. The energy will come from a water power plant 30 miles from the tunnel. The transmission pressure will be 33,000 volts. A transformer station at the tunnel portal will step this pressure down to 6,600 volt trolley pressure. The locomotives will weigh 100 tons—all on the drivers—and have a nominal capacity of 1,300 horse power—will haul a 500 ton train up a 2 per cent. grade at 15 miles per hour. Electric braking will be used. This feature will be made recuperative—consequently there will be not only a saving of brake shoes on down grade but a delivery of current from the locomotive to the line in such a way as to help out the power stations in hauling other trains up grade.

Electrification—How It Is Being Done.

41—Q. Granting that electrification is the logical means of increasing the capacity of congested steam roads, and granting that the examples of three systems (the direct current third rail, the single phase trolley, and the three phase double trolley) demonstrate the commercial success of electrification in specific cases, is it true that the technicalities of electrification handicap railway men in the acquisition of a working knowledge of the subject?

A. No. The electric motor is based on a principle as simple as that of the steam engine. Just as the steam engine depends on the expansive property of steam, so the electric motor depends upon the magnetic properties of the electric current. The magnetic properties of the electric current have been known for almost a century. They had no commercial significance, however, aside from signaling, until discovery was made of a mechanical means of generating electric current. Faraday made this epoch-making discovery 76 years ago, and thereby started the industrial revolution that this subtle form of energy is effecting. Faraday, starting with the fact that current can produce motion, succeeded in demonstrating that motion can produce current. Industrialism harnessed Faraday's discovery to the steam engine. Given the steam-driven dynamo, the evolution of the electric locomotive was inevitable.

42—Q. What are the magnetic properties of the electric current on which Faraday based his researches which resulted in his discovery of a mechanical means of inducing current?

A. The magnetic properties of the electric current are manifested by the two simple facts, namely, that currents flowing in the same direction attract one another and currents flowing in opposite directions repel one another.

INDUCTION.

43—Q. On what hypothesis did Faraday base his research?

A. He reasoned that since current produces magnetism, why, magnetism should produce current.

44—Q. Just what did he discover?

A. Faraday discovered that by changing the magnetic conditions around a wire he could induce a current in the wire during the time the change in magnetic conditions was taking place. By the way of a mental picture he imagined the-wire-carrying-the-current to be encircled by a magnetic field, and represented this field by lines of force. He knew that sending a current through a wire set up a magnetic field around the wire and that stopping the current withdrew the magnetic field. Now this dilation and contraction of the magnetic field incident to starting and stopping the current causes the lines of force to cut across adjacent wires. He discovered that this cutting of the lines of force across the adjacent wire induces an electric pressure in the adjacent wire. The result is the same whether the wire is stationary and the lines of force cut across the wire, or whether lines of force are stationary and the wire cut across the lines of force.

45—Q. So electric current is induced in a wire then by making the wire cut lines of force?

A. Yes. The induction coil or transformer, as it is known commercially, is the classical adaption of the idea. The simple transformer consists of two coils of insulated wire wound on a common iron core. Sending an alternating current through one of the coils sets up an alternating magnetic field in the common iron core. This alternating field cuts across the second coil and induces alternating current in the second coil. The pressure of the current set up in the second coil depends on the rate the second coil cuts lines of force. The rate of cutting depends upon the number of lines of force, on the frequency with which they reverse, and the number of turns in the secondary coil. A big score, a high frequency, and a secondary of many turns means a high voltage in the secondary coil. This transformer enables heavy alternating current of low voltage to be converted into a light current of high voltage. Small current means light line wire. High voltage means great power with small currents. High voltage consequently means long distance transmission of great power with small currents at small loss with a small live wire. The transformer then is the basis of long distance transmission of electric energy. It raises the voltage to the high pressure required for long distance transmission, and lowers the voltage to a safe working pressure at the point where the power is used.—March 3, 1908, meeting Canadian Railway Club.

(To be Continued.)

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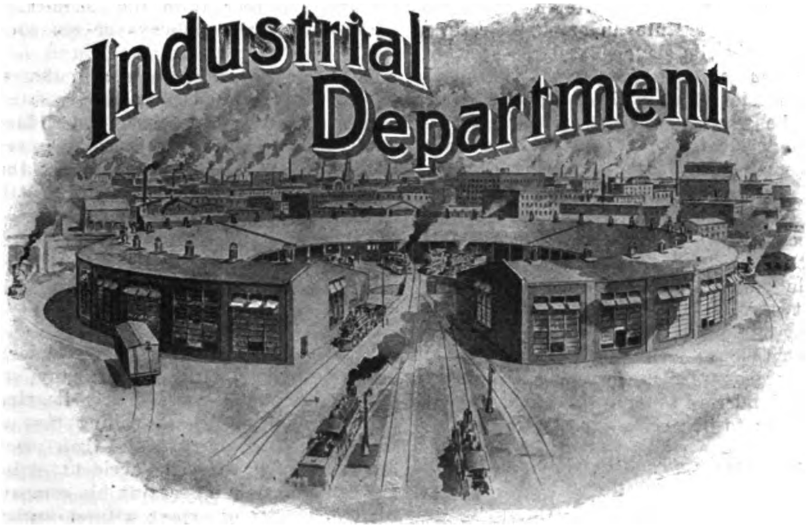

DISCUSSION OF CURRENT TOPICS

A Vile and Gratuitous Slander.

At a meeting of the New York and New England Association of Railway Surgeons, held in New York November 17th last, one Dr. R. C. Corwin, division surgeon of the Missouri Pacific Railway at Pueblo, Colo., delivered a slanderous tirade against railroad employes, in which he sought to place upon them generally the responsibility for railroad wrecks. The following extracts from Dr. Corwin's attack have been published broadcast throughout the press of the continent:

"An engineer who backed his train into an excursion train," said Dr. Corwin, "was found to have been worrying over the fact that the night before he had gambled away his pay check."

"The employe who uses his hours of recreation for gambling, drinking and smoking to excess is no more fit for work than is the man who has been on duty eighteen to twenty-four hours."

"It may be necessary to reorganize the medical departments of the railways of the country. It is far better to keep men in good physical condition than to effect cures; to provide employes with good environment."

"I am told that the greatest trouble the manager of a large railway had was to provide counter attractions to the saloon and gambling hells to which his men resorted when off duty."

"Sometimes, too, men met and married women in cheap boarding houses where conditions were none the best, and when the men were promoted their wives were found to be a handicap to them, as they failed to rise in the social scale with their husbands or to share their ambitions."

Were it not that the foregoing utterances have been given such wide publicity we would not regard them as sufficiently important to merit serious thought or dignify them with controversial attention, as they are but too evidently the mouthings of an irresponsible bigot whose contempt for the working man constitutes, no doubt, a feature of his "social" training.

Was He Rational?

Press dispatches say nothing as to whether or not he was sober, but even though these utterances gained expression through the influence of the sparkling champagne which constitutes the favorite beverage of his "social" class, it is clear that the sentiments prompting them are deep-seated in his puerile heart.

The everyday lives and habits of the

railroad men of the North American continent constitute an emphatic refutation of his vile slander, and the accident bulletins of the Interstate Commerce Commission, from which full information can be secured as to the cause of railroad accidents, will furnish prima facie evidence of the falsity of his charges. To accept as conclusive proof that railroad employes are responsible for all wrecks, his statement that an engineer "who backed his train into an excursion train had been 'worrying' over the fact that the night before he had gambled away his pay check," would be as unreasonable as would be the charge that all surgeons are reckless and irresponsible slanderers simply because Corwin happens to be one.

As a Class Railroad Employes Have No Superior.

There is no class of men in the world today who as a class are more conspicuous for their sobriety, morality, devotion to their homes and families, fidelity to duty or loyalty to the interests of their employers than are the railroad employes of the North American continent. This fact no one more fully recognizes than do the officials of the companies they serve. There is hardly a day passes that the public press does not laud the bravery of railroad men and reflect the implicit confidence resposed in them by the public. There is not a day that it does not report railroad men somewhere as responsible for the saving of human life. There is not a class of men on earth to whose credit stands a greater record of self-sacrifice in the interests of humanity. There is not a class of men subjected to greater danger or hardship in the performance of their duties. These are facts which the public generally recognizes, and of these averments we defy successful contradiction.

It is but a few weeks since President Roosevelt declared that one of the privileges he has enjoyed since being President was his membership in the Brotherhood of Locomotive Firemen and Enginemen, and further, that of all men he has become acquainted with a railroad man was his ideal of a man for the following reasons: First, "He is a man who is obedient and ever ready to accept orders from his superiors," and secondly, "he is a man who has the courage to accept responsibility and execute it."

"It may be necessary," declares Dr. Corwin, "to reorganize the medical departments of the railways of the country."

If there are many surgeons in the employ of our railroad companies who are capable of such misstatements, or so lacking in the capability of correct observation as is Dr. Corwin we will say that it *is* indeed necessary "to reorganize the medical departments of the railways of the country," and the sooner they are reorganized the better will it be for all concerned.

An Over-Ambitious Sycophant.

This man Corwin is no doubt under a yearly contract with the company employing him, and consequently imagines that in addition to misleading the unwary into signing away their legal rights, helping to settle accident claims and in damage suits serving his company in the capacity of expert witness against its injured employes, it is also one of his duties to slander railroad men, feeling that a recognition of his professional connection with them will add weight or a semblance of truth to his detractions. No doubt in his obsequious officiousness he imagines that this vile attack on railroad wage-earners will elevate him in the estimation of railroad officials. In this we are confident he will be disappointed, as we do not believe that on the entire continent there is a railroad official who understands his subordinates as the result of association with them in the practical performance of his official duties—an official deserving of the name—but who will read Corwin's utterances with deep disgust.

As to "Cheap" Boarding Houses.

As to the boarding houses which have found disfavor with this supercilious ranter because, forsooth, in his lofty (?) estimation they are "cheap," we would suggest that they possess one advantage not characteristic of the haunts of fashion—their moral atmosphere is pure—and as to the ladies who keep them—often the widows and daughters of our own men who have been killed in the service and whose loved ones are compelled thus to make a living because a barbarous economic system, aided by unjust laws and corrupt courts, has deprived them of an equitable indemnity—as to such ladies who as the honored wives of railroad men are unable to "rise" (ye gods) in the "social scale" when their husbands have been promoted to official positions in railroad service, let us say that a contemplation of the moral standard of the "social scale" in which Dr. Corwin regards it as essential to their husbands' success that they should "rise" impels us with fervor to utter the prayer, "May Heaven forbid." Far better were it that a railroad wage-earner should never be promoted to an official position than that his good wife or daughters should be subject to such risk of contamination; vastly more desirable that "along the cool, sequester'd vale of life" railroad men and their families should keep "the noiseless tenor of their way" than that what is generally recognized as "social success" should bring any of them in contact with the ostentatious, idling, sensual Du Barrys and Pompadours of New York's "Four Hundred," or similar characters that infest the less pretentious castes of "high society." Immeasurably better that our wives and daughters should continue to grace the world of usefulness with their love, purity and simplicity, cheering and blessing our homes with their truly womanly ministrations, and guiding our children in the path of righteousness, than that they should ever qualify for admission to the select "sets" with which horse shows, monkey dinners and French balls are social specialties—upstarts and parvenus whose craven souls worship at the altar of graft, whose progenitors, through the base manipulation of public officials and corrupt legislation, have built up fortunes at the sacrifice of the public welfare; degenerate, simpering social apes to whom character is naught and real usefulness a condition of base servitude. Far from aspiring to "rise" to such social circles it is our mission and determined purpose as a self-sustaining, indispensable, well-organized and powerfull class of citizens to remove this cankerous sore from the body politic and dry up this polluted source of wealth-absorption and sinful waste which exists at such an awful sacrifice to humanity.

* * *

A. F. of L. Convention—Railroad Branch Formed.

The re-election of all its officers with the exception of Daniel J. Keefe, Eighth Vice-President, who declined to be a candidate for that honor, and the formation of a railroad branch of the American Federation of Labor are conspicuous amongst the important acts of the recent convention of that great organization.

As to whether or not the Federation, through its representatives assembled, would approve of the action of its general officers, including its executive council, in having in their official capacity actively engaged in the recent political campaign was a subject of much general conjecture, and their re-election without any opposition to speak of is accepted as an endorsement of their course in this particular, which was emphasized in the case of President Gompers by the presentation to him on behalf of the convention of a handsome silver loving-cup, Mrs. Gompers being presented with a diamond ring.

Whatever views may be held as to his course in the recent political campaign, the absolute sincerity of President Gompers' efforts to promote the well-being of wage-earners is beyond question, and his unanimous re-election as president of the Federation by its recent convention but reflects the esteem in which he is held by the wage-workers of the continent, as well as by its common citizenship generally.

Railroad Branch of A. F. of L.

What is to be known as the Railway Employes' Department of the American Federation of Labor was created by the convention with the following ten affiliated organizations as a beginning: Order of Railway Telegraphers, International Freight Handlers' Union, Brotherhood of Boiler Makers and Iron Ship Builders of America, International Association of Machinists, International Association of Car Workers, International Brotherhood of Blacksmiths, Brotherhood of Railway Clerks, Switchmen's Union of North America, International Brotherhood of Maintenance of Way Employes and International Association of Steam Fitters of America.

"The purpose of this department is to enhance the welfare of all railroad employes, to aid in more closely organizing all such employes and seek to affiliate the unaffiliated with the American Federation of Labor, to further the interest of employes by means of legislation and to take such action as may be necessary to protect their interests."

Bro. H. B. Perham, President of the Order of Railway Telegraphers, was elected Chairman, and Bro. P. J. Flannery, President of the International Freight Handlers' Union, Secretary. The object of this new department is to bring about a closer union of all railway employes and to encourage the ultimate affiliation of every railroad organization with the A. F. of L. Judging from events which have transpired in the recent past, the organizations constituting this new department of the American Federation of Labor have joined forces none too soon.

Would Exterminate Them.

During the past year some of the largest railroad systems on the continent have inaugurated a crusade for the extermination of these unions, which no doubt was a feature of the panic program, by the carrying out of which the "interests" had hoped to destroy organized labor in general. No doubt the reason that these particular organizations were selected for the slaughter was because of their weakness, and it was deemed advisable in destroying the labor movement to begin with them. In the carrying out of this project the following circular was issued to its superintendents by one of the largest trunk lines on the continent:

"It is expected that employes of the ——— system outside of the classified service should not be connected with labor organizations, such as the following: National Union of Railway Trackmen, Order of Railway Clerks of America, Brotherhood of Railway Freight and Baggagemen, National Car Inspectors' and Car Repairers' Association of America, International Association of Machinists, which includes the boiler makers.

"It is ordered that superintendents will, through their organization, inform themselves concerning such employes in these various classes as may be members of these unions and remove at the earliest possible moment the leaders in our employ; and that they will follow this up with the removal of all other employes, members of the above named unions, that have not severed their connection with the unions.

"This is altogether proper under recent rulings of the court; and it is thought that the present is an opportune time to clean out these unions so far as our own system is concerned. While it should be done in a discreet way, that will involve no publicity, yet it is strictly enjoined that it be effective."

To understand the real meaning of the foregoing it is not necessary to employ the services of an interpreter. The concerns advocating the destruction of these smaller labor unions burn with the same desire to annihilate those representing the men in train service.

We heartily congratulate these organizations upon this step, feeling that thus united in one great affiliation, with the battle-cry, "An injury to one is the concern of all," they can stand invincible before the onslaughts of the enemy.

* * *

The President's Message.

The President's last message to Congress is another emphatic expression in support of the great principles for which he stands. It is doubtful that a more fearless, sincere or ruggedly honest man has ever occupied a public office than is Theodore Roosevelt, President of the United States.

Regardless of whom it might please or offend, he has consistently stood for what he regards as right, and has persistently advocated a square deal for all, and in his recent message is to be found a reiteration of his demands for just and equitable legislation in the interests of the country's wealth producers. On subjects directly affecting the interests of labor the President has the following to say:

Labor and Status of Wage-Worker.

There are many matters affecting labor and the status of the wage-worker to which I should like to draw your attention, but an exhaustive discussion of the problem in all its aspects is not now necessary. This administration is nearing its end, and, moreover, under our form of government the solution of the problem depends upon the action of the States as much as upon the action of the nation. Nevertheless, there are certain considerations which I wish to set before you, because I hope that our people will more and more keep them in mind. A blind and ignorant resistance to every effort for the reform of abuses and for the readjustment of society to modern industrial conditions represents not true conservatism but an incitement to the wildest radicalism; for wise radicalism and wise conservatism go hand in hand, one bent on progress, the other bent on seeing that no change is made unless in the right direction.

I believe in a steady effort, or perhaps it would be more accurate to say in steady efforts in many different directions, to bring about a condition of affairs under which the men who work with hand or with brain, the laborers, the superintendents, the men who produce for the market and the men who find a market for the articles produced, shall own a far greater share than at present of the wealth they produce, and be enabled to invest it in the tools and instruments by which all work is carried on.

Larger Share in Ownership.

As far as possible I hope to see a frank recognition of the advantages conferred by machinery, organization and division of labor, accompanied by an effort to bring about a larger share in the ownership by wage-worker of railway, mill and factory. In farming this simply means that we wish to see the farmer own his own land; we do not wish to see the farms so large that they become the property of absentee landlords who farm them by tenants, nor yet so small that the farmer becomes like a European peasant.

Again, the depositors in our savings banks now number over one-tenth of our entire population. These are all capitalists, who through the savings banks loan their money to the workers—that is, in many cases to themselves—to carry on their various industries. The more we increase their number the more we introduce the principles of co-operation into our industry.

Every increase in the number of small stockholders in corporations is a good thing, for the same reasons; and where the employes are the stockholders the result is particularly good. Very much of this movement must be outside of anything that can be accomplished by legislation; but legislation can do a good deal.

Favors the Postal Savings Bank.

Postal savings banks will make it easy for the poorest to keep their savings in absolute safety. The regulation of the national highways must be such that they shall serve all people with equal justice. Corporate finances must be supervised, so as to make it far safer than at present for the man of small means to invest his money in stocks. There must be prohibition of child labor, diminution of woman labor, shortening of hours of all mechanical labor; stock watering should be prohibited, and stock gambling so far as is possible discouraged. There should be a progressive inheritance tax on large fortunes. Industrial education should be encouraged.

As far as possible we should lighten the burden of taxation on the small man. We should put a premium upon thrift, hard work and business energy; but these qualities cease to be the main factors in accumulating a fortune long before that fortune reaches a point where it would be seriously affected by any inheritance tax such as I propose. It is eminently right that the nation should fix the terms upon which the great fortunes are inherited. They rarely do good and they often do harm to those who inherit them in their entirety.

Protection for Wage-Workers.

The above is the merest sketch, hardly even a sketch in outline, of the reforms for which we should work. But there is one matter with which the Congress should deal at this session. There should no longer be any paltering with the question of taking care of the wage-workers who, under our present industrial system, become killed, crippled or worn out as part of the regular incidents of a given business. The majority of wage-workers must have their rights secured for them by State action; but the national government should legislate in the thoroughgoing and far-reaching fashion not only for all employes of the national government, but for all persons engaged in interstate commerce. The object sought for could be achieved to a measurable degree, as far as those killed or crippled are concerned, by proper employers' liability laws.

As far as concerns those who have been worn out, I call your attention to the fact that definite steps toward providing old age pensions have been taken in many of our private industries. These may be indefinitely extended through voluntary association and contributory schemes, or through the agency of savings banks, as under the recent Massachusetts plan. To strengthen these practical measures should be our immediate duty; it is not at present necessary to consider the larger and more general governmental scheme that most European governments have found themselves obliged to adopt.

Present System Works Dreadful Wrong.

Our present system, or rather no system, works dreadful wrong, and is of benefit to only one class of people—the lawyers. When a workman is injured what he needs is not an expensive and doubtful lawsuit, but the certainty of relief through immediate administrative action. The number of accidents which result in the death or crippling of wage-workers in the Union at large is simply appalling; in a very few years it runs up a total far in excess of the aggregate of the dead and wounded in any modern war. No academic theory about "freedom of contract" or "constitutional liberty to contract" should be permitted to interfere with this and similar movements. Progress in civilization has everywhere meant a limitation and regulation of contract. I call your especial attention to the bulletin of the Bureau of Labor, which gives a statement of the methods of treating the unemployed in European countries, as this is a subject which in Germany, for instance, is treated in connection with making provision for wornout and crippled workmen.

Pending a thoroughgoing investigation and action there is certain legislation which should be enacted at once. The law, passed at the last session of the Congress, granting compensation to certain classes of employes of the government, should be extended to include all employes of the government and should be made more liberal in its terms. There is no good ground for the distinction made in the law between those engaged in hazardous occupations and those not so engaged.

It Is a Grim Logic.

If a man is injured or killed in any line of work it was hazardous in his case. Whether 1 per cent. or 10 per cent. of those following a given occupation actually suffer injury or death ought not to have any bearing on the question of their receiving compensation. It is a grim logic which says to an injured employe or to the dependents of one killed that he or they are entitled to no compensation because very few others than he have been injured or killed in that occupation. Perhaps one of the most striking omissions in the law is that it does not embrace peace officers and others whose lives may be sacrificed in enforcing the laws of the United States. The terms of the act providing compensation should be made more liberal than in the present act.

A year's compensation is not adequate for a wage-earner's family in the event of his death by accident in the course of his employment. And in the event of death occurring, say, ten or eleven months after the accident the family would only receive as compensation the equivalent of one or two months' earnings. In this respect the generosity of the United States toward its employes compares most unfavorably with that of every country in Europe—even the poorest.

Terms of the Act Work a Hardship.

The terms of the act are also a hardship in prohibiting payment in cases where the accident is in any way due to negligence of the employe. It is inevitable that daily familiarity with danger will lead men to take chances that can be construed into negligence. So well is this recognized that in practically all countries in the civilized world, except the United States, only a great degree of negligence acts as a bar to securing compensation. Probably in no other respect is our legislation, both state and national, so far behind practically the entire civilized world as in the matter of liability and compensation for accidents in industry. It is humiliating that at European international congresses on accidents the United States should be singled out as the most belated among the nations in respect to employers' liability legislation. This government is itself a large employer of labor, and in its dealings with its employes it should set a standard in this country which would place it on a par with the most progressive countries in Europe. The laws of the United States in this respect and the laws of European countries have been summarized in a recent bulletin of the Bureau of Labor, and no American who reads this summary can fail to be struck by the great contrast between our practices and theirs—a contrast not in any sense to our credit.

Pass a Liability Law.

The Congress should, without further delay, pass a model employers' liability law for the District of Columbia. The employers' liability act, recently declared unconstitutional on account of apparently including in its provisions employes engaged in intrastate commerce as well as those engaged in interstate commerce, has been held by local courts to be still in effect so far as its provisions apply to the District of Columbia. There should be no ambiguity on this point. If there is any doubt on the subject, the law should be re-enacted with special reference to the District of Columbia. This act, however, applies only to employes of common carriers. In all other occupations the liability law of the District is the old common law. The severity and injustice of the common law in this matter has been, in some degree or another, modified in the majority of our States, and the only jurisdiction under the exclusive control of the Congress should be ahead and not behind the States of the Union in this respect. A comprehensive employers' liability law should be passed for the District of Columbia.

I renew my recommendation made in a previous message that half-holidays be granted during summer to all wage-workers in government employ.

I also renew my recommendation that the principle of the eight-hour day should as rapidly and as far as practicable be extended to the entire work being carried on by the government; the present law should be amended to embrace contracts on those public works which the present wording of the act seems to exclude.

For Postal Savings Banks.

I again renew my recommendation for postal savings banks, for depositing savings with the security of the government behind them. The object is to encourage thrift and economy in the wage-earner and person of moderate means. In fourteen States the deposits in savings banks as reported to the controller of the currency amount to $3,590,245,402, or 98.4 per cent. of the entire deposits, while in the remaining thirty-two States there are only $70,308,543, or 1.6 per cent., showing conclusively that there are many localities in the United States where sufficient opportunity is not given to the people to deposit their savings. The result is that money is kept in hiding and unemployed. It is believed that in the aggregate vast sums of money would be brought into circulation through the instrumentality of the postal savings banks. While there are only 1,453 savings banks reporting to the controller, there are more than 61,000 postoffices, 40,000 of which are money order offices. Postal savings banks are now in operation in practically all the great civilized countries with the exception of the United States.

Parcel Post Good for the Farmer.

In my last annual message I commended the postmaster-general's recommendation for an extension of the parcel post on the rural routes. The establishment of a local parcel post on rural routes would be to the mutual benefit of the farmer and the country storekeeper, and it is desirable that the routes, serving more than 15,000,000 people, should be utilized to the fullest practicable extent. An amendment was proposed in the Senate at the last session, at the suggestion of the postmaster-general, providing that, for the purpose of ascertaining the practicability of establishing a special local parcel post system on the rural routes throughout the United States, the postmaster-general be authorized and directed to experiment and report to the Congress the result of such experiment by establishing a special local parcel post system on rural delivery routes in not to exceed four counties in the United States for packages of fourth-class matter originating on a rural route or at the distributing postoffice for delivery by rural carriers. It would seem only proper that such an experiment should be tried in order to demonstrate the practicability of the proposition, especially as the postmaster-general estimates that the revenue derived from the operation of such a system on all the rural routes would amount to many million dollars.

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A Very Important Measure.

The Sherman Anti-Trust Act was intended to operate in restraining huge illegal aggregations of capital from oppressing and robbing the common people. By judicial construction, however, it has been attempted to distort this measure into a club with which to beat the people into submission to these aggregations of capital.

On February 3, 1908, the Supreme Court of the United States, in the case of Lowe & Company against the United Hatters' Union of North America, decided that the union was a "combination in restraint of trade." The ridiculous inconsistency of such a decision and the perversion of the intention of this law which it attempts, must be evident to every sane person familiar with all of the circumstances. Lowe & Company is a firm of hatters of Danbury, Conn., which had been boycotted by the American Federation of Labor on account of its unjust treatment of its employes and its hostility to unions and union men. It sued the Hatters' Union for damages, claiming to have lost $80,000 in one year as a result of the boycott. It commenced action against the Hatters' Union in the United States Circuit Court in the District of Connecticut under Section 7 of the Sherman Anti-Trust Law. The lower court decided in favor of the Hatters' Union, declaring that that organization was not liable under the Sherman Law. This decision, however, was reversed by the Supreme Court, which invoked not only Section 7, but Sections 1 and 2 of the Sherman Anti-Trust Law, and declared: "In our opinion the combination described in the declaration (United Hatters' Union) is a combination in restraint of trade or commerce among the several States in the sense in which these words are used in the Act, and the action can be maintained accordingly." This decision means that where a labor union undertakes to divert business from non-union firms to union firms, that the organizations, as well as their individual members, are liable for damages.

From this it is but a step to securing from the highest judicial tribunal in the United States a decision to the effect that labor organizations are "wage-raising combinations," etc., etc., and consequently illegal under the Sherman Anti-Trust Act, for if combinations of every sort which affect the prices of commodities of interstate commerce are to be held illegal a distorted interpretation may reasonably be expected when desired by the "interests" classifying labor organizations amongst such combinations.

How long will it be until the Manufacturers' Association, or some similar organization, will force the court to pass upon this point? Labor must find relief in one of two courses. The Sherman Anti-Trust Law must be either repealed or amended. Whether an amendment would bring relief in the face of the existing judicial tendency to interpret laws in direct opposition to the object and design with which they were passed in order to render decisions against organized labor is problematical. If, however, relief could be secured through such a course an amendment which will be introduced by Congressman R. L. Henry, of Waco, Texas, will accomplish that result. The amendment proposed by Mr. Henry is as follows:

A BILL

To amend the Act approved July second, eighteen hundred and ninety, entitled "An Act to protect trade and commerce against any unlawful restraints and monopolies."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act approved July second, eighteen hundred and ninety, entitled "An Act to protect trade and commerce against any unlawful restraints and monopolies," be, and the same is hereby, amended by adding at the end of said Act the following section:

Sec. 9. That nothing in said Act is intended nor shall any provision thereof hereafter be enforced so as to apply to members of organizations or associations not for profit and without capital stock.

That nothing in said Act is intended nor shall any provision thereof hereafter be enforced so as to apply to agricultural products or live stock in the hands of the producer or raiser.

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Falling Off in Gross Earnings of Railroads.

The Wall Street Journal of October 30th last publishes an article by Mr. Slason Thompson, manager of the Bureau of Railway News and Statistics, of Chicago, in which Mr. Thompson claims that the falling off in the gross earnings of the railroads of the United States during the fiscal year ending June 30, 1908, from those of the fiscal year ending June 30, 1907, was $139,105,578.00. The following is an extract from Mr. Thompson's article, showing the comparisons:

Official figures are now available from which it is possible to make the following comparative summary of the gross earnings of the railways of the United States during the years ending June 30, 1907 and 1908:

GROSS EARNINGS OF THE RAILWAYS FOR THE YEARS ENDING JUNE 30, 1907 AND 1908.

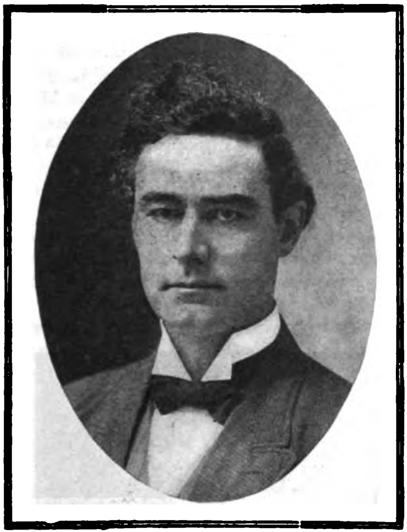
Year Ending June 30.	*Mileage.*	*Gross Earnings.*	*Per Mile.*
1907	227,454	$2,589,105,578	$11,383
1808	230,000	2,450,000,000	10,652
Decrease in earnings		$139,105,578	$731

LABOR CONGRESSMEN

As a result of the activity of organized labor in the recent election a number of Congressmen will not be found occupying in the next session of the National Legislature the seats they now fill, and in some cases these seats will be occupied by men who themselves are members of labor organizations, and earnest, practical and active advocates of the principles of unionism.

Congressman Martin.

One of these men, Hon. John A. Martin, of Pueblo, Colo., is a member of our own Brotherhood, his candidacy for Congress having been endorsed by our recent Columbus Convention.



JOHN A. MARTIN
Member of Congress

Bro. Martin was born in Cincinnati, Ohio, April 10, 1868, and his only education was secured in the common schools of Missouri. When 22 years old he commenced firing on the Santa Fe out of La Junta, having been promoted from engine wiper to fireman. This position he lost, however, in the strike of '94, whereupon he commenced the study of law, supporting himself in the meantime by editing a weekly newspaper. He was admitted to the bar in November, 1896, and removed to Pueblo, where he has since resided. In 1900 he was elected to the General Assembly of Colorado from Pueblo County, and made himself conspicuous by his work in behalf of organized labor, being instrumental in securing the enactment of the Colorado Employers' Liability Law, which is acknowledged as one of the best and most comprehensive statutes in the United States. In 1904 he was a candidate for the State Senate, but was counted out by a majority of four, and it was claimed was one of the victims of the gross frauds which, it is said, characterized the memorable Peabody-Adams campaign of that year, through which the big corporations of Colorado secured control of the government of that State.

While firing on the Santa Fe, Bro. Martin was master of Spanish Peak Lodge 28, and has also served as secretary and master of Royal Gorge Lodge, 59.

Bro. Martin's opponent is a wealthy man. He is the present Congressman from that district, having been elected two years ago by a majority of 8,000.

He is said to be closely connected with the Guggenheim Smelter Trust, and to have had as formidable a political organization supporting his candidacy as a slush fund of mammoth proportions could establish. In the face of this fact, however, Bro. Martin not only carried his own county by a majority of 1,874, but his opponent's county as well, by a majority of 800. Bro. Martin's majority in the entire district was 2,500, and his election is a magnificent protest against the corporate brigandage which has so long prevailed in Colorado. This fact can be the better appreciated by a consideration of the majority he had to overcome. How it was accomplished is aptly expressed by Bro. Martin himself, when he says, "The boys went down the line for me." Bro. Martin is the first member of our Brotherhood who has ever occupied a seat in the National Legislature of the United States.

Miner Congressmen Again Victorious.

Two other organized labor candidates who have been elected to succeed themselves as Congressmen from their respective districts are Brothers Wm. B. Wilson, of Blossburg, Pa., and Thomas

D. Nicholls, of Scranton, Pa., both being members of the United Mine Workers of America. Bro. Wilson represents the 15th District of Pennsylvania, and Bro. Nicholls the 10th District.

Congressman Wilson.

Brother William B. Wilson was born in Scotland, April 2d, 1862, the son of a coal miner. In 1870 he came to the United States with his parents and located in Arnot, Pa. In March, 1871, he commenced working in a coal mine. He joined the Miners' and Laborers' Association at the age of 16, in which organization he filled the office of Secretary. He was blacklisted because of activity in labor union matters, and for a long time was unable to secure work east of the Mississippi. For nearly two years he was a locomotive fireman on the Illinois Central Railroad in Iowa. He was a delegate to the convention that organized the United Mine Workers of America at Columbus, Ohio, January 25, 1890. He also served as District President of District No. 2, and as a member of the National Executive Board, and while serving in that capacity was arrested and thrown into jail in Maryland for an alleged violation of an injunction.

WM. B. WILSON
Member of Congress

Upon the resignation of Charles Pierce as National Secretary-Treasurer of the United Mine Workers of America in May, 1900, President Mitchell appointed Bro. Wilson to fill the unexpired term, and he was seven times successively elected to that office without opposition, handling over $20,000,000 during his incumbency of the position, and accounting for every cent of it.

The term to which Bro. Wilson has recently been elected will be his second in Congress, as he is still serving his first term in that body. He was first elected in 1906, by a majority of 381; his majority at the recent election being 1,992, or slightly more than five times that of his former election. As in the case of Bro. Martin, Bro. Wilson's opponent was also a wealthy man. Bro. Wilson carried the county in which he lives by 26 votes, running 12,771 ahead of the head of his ticket. He is the first candidate of his party to carry that county in 54 years, and the first to be elected from his Congressional District for 42 years. He had a normal majority of over 11,000 to overcome. The sworn expense account of Bro. Wilson's opponent was $14,000, while that of Bro. Wilson was less than $50.

Congressman Nicholls.

Bro. Thomas D. Nicholls, of Scranton, Pa., was born at Wilkesbarre, Pa.,

THOMAS D. NICHOLLS
Member of Congress

September 16, 1870. He attended public day school until nine years of age, and night school during the winters of the two following years. He began work as a breaker boy and worked from the age of nine until twelve as a slate picker. At twelve years of age he secured employment inside the mines and continued to work at the various occupations therein until May, 1900, when he became District President of District No. 1, United Mine Workers of America, the duties of which position it took his full time to attend to. As in the cases of Bros. Martin and Wilson, Bro. Nicholls's opponent was a man of considerable wealth, who had to his advantage the political prestige of having served for five consecutive terms, or a total period of ten years in the Pennsylvania House of Representatives, having been Speaker of that House during one of those terms.

In the face of this, however, and notwithstanding the fact that Bro. Nicholls had a normal majority of about 4,000 to overcome, he won out by over 700 votes.

Labor Is Awakening.

When we stop to realize the appalling odds against which these men have had to fight—the immense normal majorities which it was necessary for them to overcome—and then take into consideration the fact that they ran ahead of other candidates on their respective tickets sufficiently to not only win, but as well to insure their election by very comfortable and even very large majorities, the conclusion is inevitable that labor is awakening.

Their success, and that of many other members of organized labor in the recent election, is a truly heartening example of what wage-earners can do when they stand together in supporting men from their own ranks who are candidates for public office, and especially for membership in the law-making bodies of the country.

To such men as Martin, Wilson and Nicholls, it will not be necessary for labor organizations to send letters and petitions appealing for their support for measures in the interest of labor, or for their opposition to legislation hostile to the well-being of the wealth producers.

They already know the legislative needs of the workers. They have gone through experiences which have clearly demonstrated to them how great are the wrongs from which the toilers suffer, and as members of Congress they will stand as able defenders of their rights and fearless and uncompromising advocates of their cause.

The "Interests" Are in Politics.

The Rockefellers, Morgans and Carnegies, etc., have been doing very well, and it is about time that labor should have an inning. The "interests" have been active in politics for many years, and there has been no time since this activity commenced that they have not had control of Congress, and as a result have constantly utilized the National Legislature, as well as other law-making bodies, in their predatory exploits.

If wage-earners would only stand together, regardless of party affiliations, especially in every district they can control, and send to Congress representatives from their own ranks, it would not be long until workingmen as a class would be in the full enjoyment of their just rights.

Whenever labor uses its political power in the advancement of its industrial and economic interests, it will come into its own.

Their Lives a Constant Battle.

In "the short and simple annals of the poor" are recorded the lives of these men and of others like them, who through the power of united labor will eventually gain that recognition to which their merit so well entitles them. Children of poverty, born in the dwellings of the humble working man, with nothing on earth but the right to live and the hope of Heaven, with neither fortuitous circumstances nor the smile of the powerful, they have triumphed over adverse fate and wrung success from reluctant fortune.

In the brief epitome of events which constitute, as it were, milestones in their careers, there is that which stirs the blood as swiftly as the romantic adventures of the ancient Crusaders sends the red fluid coursing through the veins of a lad.

Waging an unequal fight against poverty, as students learning their lessons by the light of the tallow dip, as leaders of men struggling for right and for justice against the power of wealth and entrenched greed, as fearless defenders of the cause of the humble, rejecting with scorn all offers tendered as inducements to lure them from the support of that cause, as outcasts wandering over the country to escape the blacklist; or again by their earnest advocacy of the rights of men, winning the plaudits of their fellows for the eloquent presentation of truth; in adversity or prosperity, in sunshine or in storm, whether in the gloom of defeat or glorified by victory, such men are ever the same, modest, steadfast and sincere—their lives a tribute to the toiler.

* * *

Douglas Shoe Not Union Made—Notice from Our Brothers of the Boot and Shoe Workers' Union.

With a view to familiarizing our readers with their union label the Boot and Shoe Workers' Union has been advertising it in our Magazine for many years. Our members, therefore, can make no mistake as to the proper identity of that label, and as a consequence no misrepresentation or deception can be practiced on them in this particular.

Owing to a controversy which has arisen between the Douglas Shoe Company and its employes whereby that company is no longer entitled to the use of the union label the Boot and Shoe Workers' Union desires through the following notice to present the facts in the case to the members of our Brotherhood so that they will not be misled into purchasing Douglas shoes as a result of the impression that they bear the union label when as a matter of fact they do not:

To Whom It May Concern:

So many misleading articles have appeared in the public press with reference to the Douglas controversy, we issue this brief and accurate statement of facts:

In January, 1908, the Douglas Company transferred 25 cases (600 pairs) per day of $3.50 shoes from their No. 1 to their No. 2 factory and expressed their willingness to accept inferior work, for which they would pay the same wages as paid on their $3 shoes.

In June, 1908, they had increased the $3.50 shoes so transferred to 1,800 pairs per day. These shoes were then transferred back to the original No. 1 factory, at which time the wages on their entire $3.50 product,. amounting to between 6,000 and 7,000 pairs per day, were placed under this No. 2 or reduced scale of wages, thus establishing a condition wherein no transfer had taken place, which justifies us in the conclusion that the transfer of shoes was for the purpose of securing a reduced labor cost, contrary to the arbitration method in vogue between the Douglas Company and the Boot and Shoe Workers' Union for the previous nine years.

We contended that this method of securing reduced wages was inconsistent with collective bargaining and, we assert, contrary to our arbitration contract with the company. The company being sustained by the Massachusetts State Board of Arbitration, both in their right to transfer and to pay a lower labor cost, we exercised our legal and moral right to discontinue the arbitration contract at its expiration November 1, 1908. We have complied with all the decisions of the State Board of Arbitration and all our obligations under the contract without a stoppage of work in any department during ten months of disagreement as to the right of the company to transfer and to impose a new scale of wages without the consent of the union.

Hereafter the Douglas shoes will not bear the union stamp of the Boot and Shoe Workers' Union. Please bear in mind that no shoe is union made unless it bears a plain and distinct impression of the union stamp.

Respectfully yours,
BOOT AND SHOE WORKERS' UNION.
By JOHN F. TOBIN,
General President,
246 Summer street, Boston, Mass.
November 4. 1908.

* * *

Nonunion Books.

The General Eight Hour Committee, of Akron, Ohio, representing the locals of the Typographical Union, International Brotherhood of Book Binders, Printing Pressmen's Union and Printing Press Assistants' Union, of that city, has issued a circular advising that a number of books published by the Werner Company, of Akron, Ohio, and which are now being strongly advertised, are the products of nonunion labor. These books as specified by the circular are, "Makers of History," "The Works of Muhlbach," "Historians' History of the World," the "20th Century Encyclopedia," and other editions of the Encyclopedia under different names. The circular further states that this company is making a special effort under its own name to push the sale of the works of

Maupassant and of the "New American Encyclopedia Dictionary," and further declares that every publication now being produced or marketed by the Werner Company is the output of nonunion labor, and urges that no attention be paid to any claims to the contrary that may be made, either through advertisements or by the Werner Company's personal representatives.

* * *

Organized Labor Scores a Most Important Political Victory.

The defeat of Congressman James A. Watson, candidate for Governor of Indiana, at the recent election, shows what can be accomplished by concerted action on the part of organized labor in keeping its enemies out of public office.

Watson is one of those smooth politicians who, while professing friendship for the working class in order to secure their political support, quietly antagonizes their interests in co-operation with such men as Joe Cannon. In fact Watson is recognized by those familiar with his official movements as a tool of the "interests" in Congress, and is regarded as a man who can always be depended upon to push the cause of plutocracy at the sacrifice of the people's welfare. As a consequence the organized wage-earners of Indiana officially, vigorously and effectively opposed his candidacy for the governorship of that State.

The railroad men of Indiana are to be congratulated upon the fact that their opposition alone represented a sufficient loss of votes to cause Watson's defeat. On November 24, 1907 (long before Watson was nominated), at a union meeting in Indianapolis, held under the auspices of the B. of L. E., O. R. C., B. of L. F. and E., B. of R. T., and O. R. T., resolutions were adopted vigorously protesting against his nomination.

These resolutions appear in the January, 1908, issue of the Magazine, in connection with an account of the union meeting. Twice subsequently thereto the Magazine in editorial references to the matter, made it clear that his nomination would be very distasteful to railroad employes, and published that part of his Congressional record which showed him to be their enemy, and warned his party as to what might be expected in case he should be placed at the head of its ticket in Indiana. Notwithstanding this, however, he was nominated, and it is said that finances were not lacking in the accomplishment of that end.

A few individuals—"friends" of his, who professed to be regarded as leaders in railroad circles—vainly tried to make it appear that he had a railroad following, notwithstanding the official action in opposition to his candidacy taken by railroad labor organizations, of which at least two of these "individuals" were members. Their efforts were so futile, so miserably feeble, however, and the punishment of suspicion and distrust amongst their fellows which they incurred by their action so severe, that they are regarded more with pity than resentment by the men whose confidence they formerly possessed.

The defeat of Jim Watson for the governorship of Indiana is a clear demonstration of the fact that railroad employes and organized labor in general, will oppose to the bitter end the election of their enemies to public office, and that their efforts in that direction will not be in vain.

* * *

Typographical Union Versus the Butterick Company.

Typographical Union No. 6, of New York City, has issued a circular calling the attention of union men to their struggle with the Butterick Publishing Company of that city. The circular states that for three years the Typographical Union has been trying to unionize the composing room of that concern. It also states that the Butterick Company locked out its union compositors for allegiance to their obligations as union men on November 24, 1905, and that it is now attempting to prove that 27 union printers are criminals because they dared to state the truth of the situation before the public.

In the literature which it is distributing regarding the controversy the printers' organization declares that union men have taken up the fight and that its effects are being felt by the Butterick Company, whose unfair magazines and patterns are known in every city and village on the North American continent, and further, that this fight has aroused the sympathy and enlisted the services of many outside of the ranks of organized wage-earners, especially among professional and literary men and women.

The circular emphasizes the fact that the Butterick Publishing Company is endeavoring to have the New York Supreme Court fine and imprison the officers of Typographical Union No. 6 because they have told the truth about the unfair stand of that concern towards organized labor, and declares that no judge can compel a person by injunction or otherwise to patronize any concern that they do not wish to patronize, and that there is no reason why the money of wage-earners or their sympathizers should be spent for Butterick patterns or magazines if on account of that firm's hostility to organized labor they feel like purchasing similar products of another concern.

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Union Bakers Versus the American Bakery Company.

In a circular recently issued by the International Union of Bakery and Confectionery Workers, that organization seeks to notify all members of organized labor that the American Bakery Company, of St. Louis, has been fighting their organization since last May, when they locked out all of its members in their employ and declared for the open shop. The circular declares that the American Bakery Company is a trust concern, consisting of the following firms: Heydt Bakery Company, Condon Bakery Company, Hauck-Hoerr Bakery, St. Louis Bakery Company, Welle-Boettlor Bakery, Home Bakery Company, and Freund Brothers' Bakery.

The circular states further, that if the 45,599 members of labor organizations in St. Louis would do their duty towards their organized brothers in the bakery industry, these firms would soon be compelled to make peace with the Bakery and Confectionery Workers' Union. The circular earnestly appeals to our members to remember that this American Bakery Company is unfair to organized labor.

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Some of the Chief Points in the President's Message.

There should no longer be any paltering with the question of taking care of the wage-workers who, under our present industrial system, become killed, crippled or worn out as part of the regular incidents of a given business.

It is humiliating that at European international congresses on accidents the United States should be singled out as the most belated among the nations in respect to employers' liability legislation.

There must be prohibition of child labor and diminution of woman labor.

Great fortunes rarely do good and they often do harm to those who inherit them in their entirety.

The railways of the country should be put completely under the Interstate Commerce Commission and removed from the domain of the anti-trust law.

Power to make combinations and traffic agreements should be explicitly conferred upon the railroads, the permission of the commission being first gained and the combination or agreement being published in all its details.

Rates must not be reduced in such fashion as to necessitate a cut in the wages of employes or the abolition of the proper and legitimate profits of honest shareholders.

Exactly as the anarchist is the worst enemy of liberty and the reactionary the worst enemy of order, so the men who defend the rights of property have most to fear from the wrongdoers of great wealth, and the men who are championing popular rights have most to fear from the demagogues who, in the name of popular rights, would do wrong to and oppress honest business men of wealth; for the success of either type of wrongdoer necessarily invites a violent reaction against the cause the wrongdoer nominally upholds.

The opposition to government control of these great corporations makes its most effective effort in the shape of an appeal to the old doctrine of States' rights. The central government is the only power which, without oppression, can nevertheless thoroughly and adequately control and supervise the large corporations.

There should be a law permitting combinations in the interest of the people, but under control of the national government.

Telegraph and telephone companies engaged in interstate business should be put under the jurisdiction of the Interstate Commerce Commission.

This government should pass a model employers' liability law.

The eight-hour day should be extended to the entire work carried on by the government.

The establishment of a local parcel post on rural routes would be to the mutual benefit of the farmer and the country storekeeper.

There should be legislation to provide a complete plan for organizing the great body of volunteers behind the regular army and national guard when war has come.

Immediate admission of New Mexico and Arizona as separate states is urged.

Liberal increase in the navy is recommended.

Postal savings banks are advocated.

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JUDGE HYNES REPLIES TO CORWIN'S DIATRIBE

In a recent issue of the Rocky Mountain News appears the following able letter from Judge William F. Hynes, delegate from Rocky Mountain Lodge 77 to our recent Columbus Convention, in which he replies to Surgeon Corwin's vicious attack on railroad employes:

To the Rocky Mountain News:

In your issue of the 18th instant you state that Dr. R. C. Corwin, division surgeon of the Missouri Pacific Railroad at Pueblo, Colo., had read a paper before the New York and New England Association of Railway Surgeons at the Academy of Medicine in New York, in which the doctor is quoted as saying that railroad wrecks in this country are brought about by railroad employes who drink, gamble and indulge in other forms of dissipation, and not because they are hard worked.

These, as the special wire of the News states, are some of the counts which Dr. Corwin brought against railroad employes, whose mode of life he declared the contributing cause of railroad disasters: Gambling, jealousy, drink, smoking to excess, domestic trouble and social ambitions. "I am told," the doctor is quoted further, "that the greatest trouble the manager of a large railway had was to provide counter attractions to the saloons and gambling hells to which his men resorted when off duty."

Such a slanderous statement ordinarily would not be noticed, but coming from one who occupies the position and the association with the railroad managers as is here intimated, it should not go unchallenged.

Charges Come As An Astounding Surprise.

If there is any one class of men, as a class, who are free from the abuses and the dissipations charged by the doctor, the railroad men of this country are that class. This is so well known and so well established that the statement made by the doctor comes as an astounding surprise. Under what conditions he could have made the statement or on what he based it we are not informed. Perhaps the manner and the place and the circumstances where it was made might have induced the doctor to this rashness and folly. It certainly is not complimentary to the management of the railroads of this country, and I would hesitate to state that they in any way would approve it.

This class of workmen gives us a citizenship the peer of any in the republic. There is no body of workmen, professional or otherwise, who go to greater trouble and expense to perfect themselves in the efficient discharge of the duties of the responsible positions which they hold. Each of the six organizations, to wit: the Order of Railroad Conductors, the Brotherhood of Locomotive Firemen and Enginemen, the Brotherhood of Locomotive Engineers, the Switchmen's Union, the Order of Railway Telegraphers and the Brotherhood of Railroad Trainmen, publish monthly periodicals, each having a circulation of from 30,000 to 110,000. These periodicals are devoted to the education of the men in their respective callings and for the elevation of their social and moral standing. The Locomotive Firemen and Enginemen's Magazine, for instance, whose monthly edition exceeds 70,000, maintained solely by the enginemen of this continent, expends thousands of dollars in securing the best technical and practical knowledge on the locomotive, its care, management, etc., illustrated by colored engravings, based on advanced scientific principles; also electricity as applied to locomotives and kindred subjects.

"Social Ambition" Plays Little Part.

When we consider these facts we wonder at the strange effects of gambling, drunkenness, social ambition and other vices. Social ambition—God bless the mark—what a demoralizing effect this vice must have on the railroad employes and their families.

The Interstate Commerce Commission publishes from time to time what is known as the Accident Bulletin, showing the number of accidents on railroads for certain designated periods, and it is therein stated, far too often, that the collision was due to the men who had been worked flagrantly long hours. Scarcely an issue of that bulletin that does not show the cause of accidents to be due to excessively long hours, and indeed the publication of the last Accident Bulletin makes the statement: "Many accidents are reported in which the men had been on duty excessively long hours." And on some railroads there are hundreds of cases charged against the railroad company for exceeding the hours of employment.

Aside from the rest necessary to the men, the great and imminent danger resulting from long hours of such employment is too obvious even to call the doctor's attention to it. There may be railroad men who drink to excess and who are guilty of other dissipations, but I am of the opinion that there are only isolated cases of this character. To say that railroad wrecks are brought about by railroad employes who drink and gamble and not because they are overworked is a sweeping statement and a vile slander which ill becomes the standing of any man, particularly one who should know better than to brand hundreds of thousands of reputable citizens as drunkards and gamblers. He resorts to a statement whose application may be made to any class of professional or working men—that "the employe who uses his hours of recreation for gambling, drinking and smoking to excess is no more fit for work than is the man who has been on duty eighteen to twenty-four hours." This is a cowardly statement, because the same would apply, as I have stated, to doctors or lawyers, but in this connection he desires to leave the inference that railroad employes are addicted to these vices.

Yoakum's Eulogy of Railway Employes.

This indeed is a sad reflection upon the railroad managers of this country. In fact, with the increase of the business of the railroads for the next ten years, as compared with the development of the country and the construction of railroads for the past ten years, it is computed that one man of every six of our entire adult population would be a railroad employe, or a total of 4,000,000 employes, which Mr. Benjamin F. Yoakum of the Rock Island lines characterizes as a "great, magnificent army of men." Evidently Mr. Yoakum had not consulted the doctor before that gentleman had volunteered and gone out of his way to cast reflections upon men who are so worthy of respect and commendation. Last September, in the city of Columbus, Ohio, was held the Biennial Convention of the Brotherhood of Locomotive Firemen and Enginemen, at which were present about 740 delegates. Mr. Yoakum appeared before the convention to show the representatives of that organization the wisdom of affiliating themselves with the American Railway Employes and Investors' Association. In the course of his forcible and convincing argument, among other things he stated: "And as American citizens, considering your efficiency and loyalty, the money is well paid to you when your standard is compared with the standard of employes in any other country on earth."

The articles of organization of the American Railway Employes and Investors' Association sets forth that said association is organized for the purpose "to do whatever lawful things may be necessary in order to secure a fair return alike to capital and labor invested in American railroads, with due regard at all times to efficient service, fair treatment and safety to the public."

Does the doctor's statement bear out the solicitation and the expressions made by Mr. Yoakum? Does Mr. Yoakum, who, it has well been stated, "has under his supervision employed in railroad service probably more railroad men than any other living man in the United States," does he seek the assistance and counsel of men who, as the doctor states, are drunkards and gamblers?

Railroad Managers Have Faith in Workers.

But Mr. Yoakum's actions and expressions are only one instance of the number of railroad managers of the United States who enter into contracts with their employes and are loud in their praise not only of the loyalty of the men to the interests of their employer but of the careful management and transportation of the lives and property that are placed in their charge.

Is it because a doctor who, in a drunken condition, may do a great injury to his patient's health, that one should prepare a paper on a scientific subject stating that all deaths and wrecks of life and health were caused by the malpractice of drunken physicians and surgeons?

It is gratifying to know that the sentiments reputed to have been expressed by Dr. Corwin are not entertained by the railroad managers of America, and I take it that the position of those gentlemen—the general managers—who take every conceivable precaution by rules and regulations, examination of employes, the adoption of safety appliances and every known method of construction and maintenance to reduce the possibility of accidents to the minimum, gives them better knowledge of the habits and customs of their employes than that of Dr. Corwin. The men on the engine, against whom he seems to give a particular accusation, are usually the first to suffer the disastrous results of a wreck, and indeed the heroism of these men on countless occasions in the sacrifice of their lives to safeguard the lives and property entrusted to them are far too numerous to even undertake to chronicle their dates here. Their widows and orphans are not accounted for in the profit and loss of the maintenance of way.

Human Life Cheaper Than Wood and Iron?

It has been asked in some of our current monthlies and in a late issue of our daily journals: "Are the doctors' bills charged against the road along with the wear and tear or the deterioration to the rolling stock?" No. "Is the value of human life to the widow and orphan children assessed as a regular and necessary expense in railroading?" No. "Is the helplessness of the cripple appraised and paid for along with the locomotive that went through the culvert?" No. Why? "Is human life cheaper than wood and iron?" "Are blood and agony more negligible than box cars and running gear?" "Is it just that the lumber and junk should be charged up to the loss of the stockholders and the feet and hands of the engineer be charged up to his wife and children?"

These are considerations that appeal very strongly to our sense of justice and will, sooner or later, as it is now in other portions of the world having no such pretensions to advancement as we claim, be considered a part of the running expenses.

It is just such expressions as this uncalled for and unwarranted attack made by Dr. Corwin that have a tendency to create ill feeling and misunderstanding between employer and employe, where only courtesy and respect did and should exist. So, indeed, must the men who hold these positions of such great responsibility, and who are striving so hard to lessen the casualties brought about by their hazardous calling, keenly feel the great injustice done to them and their families by the imputations and charges of Dr. Corwin.

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The Oklahoma Eight-Hour Law.

During the business depression of the past year or more the government of a certain large city in a semicharitable spirit undertook to employ laborers on public works at the rate of $1 per day. The injustice of thus taking advantage of the necessities of workingmen to secure their services at so much less than their value must be apparent to all.

Under the eight-hour law of the State of Oklahoma this would be impossible, and if the common people in every State would assert themselves and become interested in the affairs of its government to the extent that they are in Oklahoma, such a thing would be impossible. The Oklahoma eight-hour law is as follows:

An Act to put into effect section 1 of article 23 of the Constitution, providing what shall constitute a day's work in all cases of employment by and on behalf of the State or any county or municipality, prescribing penalties for violations thereof, and declaring an emergency.

Be it enacted by the people of the State of Oklahoma:

Section 1. Eight hours shall constitute a day's work in all cases of employment by and on behalf of the State or any county or municipality.

Sec. 2. Any person, firm or corporation, or any agent, contractor or subcontractor, who shall violate the provisions of this act, or who shall aid, abet, assist, connive at, or permit any violation thereof, is guilty of a misdemeanor and, upon conviction, shall be punished by a fine of not less than fifty ($50.00) dollars, nor more than one thousand ($1,000.00) dollars, and by imprisonment of not less than thirty days nor more than six months, or by both fine and imprisonment. Each day such violation continues shall constitute a separate offense.

Sec. 3. *Not less than the current market rate of wages in the locality where the work is performed shall be paid.*

Sec. 4. For the preservation of the public health, peace and safety, an emergency is hereby declared to exist, whereof this act shall be in full force on and after its passage and approval.

Approved May 27, 1908.

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*Labor Interests in the Courts.**

Damages Awarded by Jury Held Excessive by Court.—Oscar F. Strand recovered a verdict of $30,000 for personal injuries from the Great Northern Railway Company. The injuries were caused by the explosion of the boiler in the locomotive on which he was working as a student fireman.

At the time of the injury he was on the front engine of a so-called "double-header" freight train going easterly, which, at the time of the accident, was at a point where the mountain grade averaged 2.2, being an ordinary mountain division grade.

It is undisputed that about four feet of the front end of the crown sheet, over the firebox, was blown down by the steam pressure in the boiler.

The complaint in the action charged that the company was negligent in permitting the engine to get out of repair, in allowing its boiler to become covered with mud and sediment, and to be in an unsafe and dangerous condition. The answer alleged that the explosion was due solely to the failure of keeping a sufficient supply of water in the boiler, and that Strand and the engineer were negligent in that respect. Considerable evidence was submitted on both sides of the case. A machinist by the name of Watts, employed at the Delta roundhouse, Everett, Wash., testified on behalf of Strand, that two nights before the accident the foreman had directed him to make an examination of this engine; that he had done so, and found the crown sheet "wavy" between twelve and thirteen rows of crown bolts in the front of the firebox, and the sheet was leaking where the seam lapped onto the fire sheet, and also around twelve or fifteen of the crown bolts. This condition was characterized by some of the witnesses as "touched up," which means overheated. Watts was corroborated to some extent by his helper, Stephens.

Strand testified that immediately before the happening of the accident he had examined the gauge, and found it indicated that the boiler was well filled. A witness testifying on behalf of the company, stated he was a machinist and that it was his business to inspect engines; that on the day before the explosion he had examined the engine in question and found it in good condition.

Davis, the engineer at the time of the accident, testified that so far as he knew, the injectors and water gauges were operating all right; that the engine was doing proper work, and "guessed that, if it had been handled absolutely properly, the accident probably wouldn't have occurred."

Several witnesses were called as experts by the company, who testified that the engine would not operate or do its work properly if in the leaky condition described by Watts, and, from the condition of the bolt heads that were pulled out at the time of the explosion, it was their opinion that they must have been burned off at that time, which could not have happened unless the crown sheet at the front end of the engine had been exposed to the fire without being covered with water. The company laid considerable stress upon the fact that when the fusible safety plug, or so-called "telltale," was taken from the crown sheet after the explosion, the babbitt metal had melted, and its condition indicated that it must have done so before the explosion, which signified that the water in the boiler was allowed to get too low. On the other hand, experts called on behalf of Strand testified that the very purpose of the telltale is to indicate that the water in the boiler is getting low; that, when the crown sheet is not protected by water, the heat melts the metal in the telltale and allows the water and steam to run through the tube, putting out the fire, and thus giving the signal for which the apparatus is intended.

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*Prepared for the Locomotive Firemen and Enginemen's Magazine by Geo. H. Murdoch, Jr., New York, N. Y.

The case was appealed to the Supreme Court of Minnesota, which affirmed the judgment below in connection with an order for the remission of one-third of the amount. The opinion is in part as follows:

"Without reviewing the various statements and claims of the respective witnesses upon the several points which were the subject of investigation, in our judgment the evidence was sufficient to justify the jury in finding that the crown sheet and bolt heads of the boiler had been "touched up" on previous occasions; that the boiler was in a leaky and defective condition when in the roundhouse the day before the accident; that it was not properly inspected and repaired, and was sent out on the road in an imperfect condition, which was not discovered by either the engineer or fireman; that respondent, as fireman, and the engineer, were not negligent in the performance of their duties; and that the explosion was the result of the faulty condition of the boiler when the engine was turned over to them.

"A verdict of $30,000 in this case was large; but, under all the circumstances with respect to respondent's injuries, we are not able to say that it was so excessive as to indicate that the jury were influenced by passion or prejudice in arriving at the amount.

Respondent is a young man, 26 years old, and well and strong before this accident. As a result of his injuries he was in a hospital in Everett for about six months, and the physician who treated him after his return to Foley testified that five-eighths of his body showed evidence of burns of different degrees; that about two-thirds of the surface of his legs were seriously burned and covered with scars, a majority of which would be classed as burns of the third degree—burns where the tissue is destroyed, and nature reproduces a new fibrous tissue; that such burns affect the nerves and superficial vessels supplying the skin, which are bound down and strangulated in this new reproduced fibrous tissue, causing constant irritation, for which there is no cure; that he did not think there was any chance for improvement; and that in his opinion respondent would never be able to do any work.

Respondent testified that he was unable to walk erectly, or to do any work, and suffered great irritation and discomfort with changes in the weather. While it seems that the burns are healed, and the functions of his body are normal, yet, if this record is true, respondent is crippled for life, unable to engage in any kind of active physical work, and will always suffer more or less irritation and pain. Still his mental faculties are unimpaired and no doubt he will be able to attend to some lines of employment which do not require much physical exertion. Under all the circumstances of the case we conclude that the verdict is excessive to the extent of $10,000."

Strand v. Great Northern Ry. Co., 111 N. W. 959.

Inspection of Engines—Company Wins.—Frank E. Johnson, employed as a locomotive engineer by the Minneapolis, St. Paul & Sault Ste. Marie Railway Company, while engaged in his duties in the yards of the company at Minneapolis, was walking along the footboard on the side of the engine, intending to cross in front of the boiler and return to the cab on the other side. Just as he was in front of the cylinder on the right-hand side, the head of it blew off, struck him, and threw him down on the track in front of the engine, and he was immediately run over and killed.

His administrator sued the company for damages on account of his death, the complaint alleging that the accident and death of Johnson were wholly due to the defective and unsafe condition of the engine, of which unsafe condition the company had notice and knowledge at and prior to the time of the accident, and, having such notice and knowledge, it negligently failed to repair the same.

The answer denied that the company had any knowledge of the unsafe and defective condition of the engine prior to the accident, and denied that it failed, refused and neglected to repair the same, or that it had any notice that repairs were required.

The answer also alleged that by the rules of the company Johnson, as such engineer, was charged with the inspection of his engine, and that it was his duty to ascertain any defects therein, if any existed, and to report the same in a repair book for repairs, and that, if there was any neglect with respect to the inspection and repair of the engine, it was the fault of the engineer.

The engine was a switch engine of the ordinary type, upon each side of which was what is known as a "crosshead," which was operated between guides. In the forward part of the crosshead is fastened an iron rod, about 2 9-10 inches in diameter, known as the "piston rod," the other end of which is fastened into the piston head, which operates in the cylinder. In the rear portion of the crosshead is fastened another iron bar, known as the "main rod," which connects the crosshead with the engine wheels.

The piston head is driven forward and backward by the automatic arrangement, which injects and exhausts the steam alternately before and behind the piston head. In this instance, when the piston head was being driven forward by steam which had been let into the cylinder behind it, the piston rod broke inside of the crosshead, thereby releasing the piston head, which was driven through the front end of the cylinder by the expanding steam.

The crosshead is a steel block, and the piston rod penetrates it several inches, and is held firmly in place by a steel wedge, which is driven down through a slot in the crosshead through a corresponding slot in the end of the piston rod. The break occurred on the inside of the crosshead, where it could not be seen or detected by the engineer, or any other means of inspection, unless the rod was taken out of the crosshead.

It was conceded on the trial that the engineer was not guilty of negligence in not inspecting or detecting the cause of the break. It was also conceded by the company that the accident was occasioned by the breaking of the rod, as stated, and the only question at issue, and submitted at the trial, was whether or not the company had used due diligence in inspecting and repairing the engine.

It was claimed on the part of plaintiff that, if the company had used ordinary care in making inspection of the crosshead and the piston rod, it would have taken the same apart within a reasonable time prior to the accident, and, if that had been done, that the incipient fracture would probably have been discovered. On the other hand, the company contended that it had done all that it could be reasonably expected to do, that it made such inspection as was customary, and that it was not practicable to dismantle the engine to the extent of removing the rods from the crosshead for the mere purpose of determining whether the integral parts were perfect.

The court submitted the question to the jury, for them to determine whether, as a matter of fact, under all the circumstances developed by the evidence, the company had used reasonable care in inspecting the engine.

The jury returned a verdict for the company, whereupon the administrator of Johnson's estate, after denial of a motion for a new trial, appealed to the Supreme Court of Minnesota.

In the Appellate Court the lower court was affirmed in an opinion from which we quote the following:

"The court stated that, before respondent company could be found negligent in failing to make the inspection, they should find that it had a system in operation which would have discovered the defect in time to remedy and avoid the accident.

"It was undisputed that the fracture which resulted in the break was concealed, and could not have been discovered by any of the ordinary processes of inspection, either by the engineer or mechanics in the repair shop. It also appears that the crosshead was so constructed that it was not essentially different from other parts of the engine, which were solidly joined and were not intended to be taken apart during ordinary repairs. Consequently, the system of inspection which the court referred to was one which would apply not only to the crosshead, but to other parts of the machinery and to all other engines. In other words, if respondent was guilty of negligence in not taking apart the crosshead and rod in order to inspect the end of this particular piston rod, then it was equally negligent in failing to take apart other portions of the engine which were similarly constructed. If that rule should apply to this engine, then it should apply to all engines. All through the trial, more or less was said about the system, or custom, of inspection, and it was only a reasonable and fair conclusion, from the evidence, that respondent would not be negligent in the instance charged, unless it was negligent in failing to adopt a general plan of inspection for all such parts including all of its engines."

Cederberg v. Minneapolis, St. P. & S. S. M. Ry. Co., 111 N. W. 953.

An Anticipated Wreck—"No Casual Connection."—During a yellow fever epidemic a special train was made up at New Orleans on the New Orleans Great Northern Railroad to carry a yellow fever patient from Covington to New Orleans.

Wm. J. Gahagan was the fireman on the train. When the train got near the station of St. Tammany, about 1,000 feet from the station house, the engineer, if he had been looking, would have seen an obstruction on the track, consisting of a team of oxen dragging a wagon of three pilings of unusual length and size. Gahagan was firing at the time and did not look up. If the engineer saw it he made no effort to stop or check the train. When Gahagan saw it the train was not over 142 feet from the obstruction, and realizing that it was impossible for the oxen to get across the track before the engine reached that point, and his engineer having jumped, and called to him to jump, too, he jumped from the engine cab onto the ground.

The locomotive and train attached rushed on and dashed into the wagon of piling, and contrary to all reasonable expectations and extraordinary in the extreme, instead of the train being derailed and smashed to pieces, it snapped the piling in two without leaving the tracks and with slight damage to the engine, and proceeded along the track.

Gahagan broke his leg as a result of the aforesaid jump from the train, and was carried into the city of New Orleans and taken to a sanitarium. Owing to the severity of the fracture it became necessary to amputate the limb.

He later sued the company for $15,233.83 damages, alleging that had the engine been in good repair, and particularly had the brake thereof been in good working order and not in the dilapidated and imperfect condition that it was, that the engineer could have stopped the train in ample time to have prevented the accident. He made no allegation, however, that the engineer made any attempt to stop the train. There was a judgment in favor of the defendant and Gahagan appealed. This judgment was affirmed by the Supreme Court of Louisiana, which said:

"It appears from plaintiff's petition that the engineer not only did not stop the train, but that he jumped off before the obstruction was reached, and that he himself followed his example, and that no injury resulted to the train from its collision with the ox team.

"From this recital of facts the alleged proximate cause of plaintiff's injury was the failure of the engineer to see, as he should have done, the obstruction clearly visible ahead of him, coupled with his own unnecessary act of precipitately jumping from the train.

"The engineer and the fireman occupied the relation of fellow servants, and plaintiff has no right of action under the circumstances stated.

"Plaintiff insists, however, that his petition shows that, had the engineer attempted to have stopped the train, his effort to do so would have been futile, as the engine was out of good repair, the brake particularly so, it being in a dilapidated and imperfect condition.

"It is true that such an allegation was made, but there is no averment that the engineer made any attempt to stop the train, and that it was by reason of the defects charged that the accident occurred.

"Under the allegations the defects in the engine brake had nothing to do with the plaintiff's injury. There is no casual connection between the two."

43 So. (La.) 900.

Failure to Exercise Due Care—Verdict for Fireman.—Marion sued the St. Louis & San Francisco Railroad Company to recover damages for injuries while in its service. He was fireman on a locomotive and while at work was thrown from it by reason of the breaking of a drawbar which coupled the engine and tender together. He stood on the coupling and was engaged in shaking the grate of the engine when the coupling or drawbar broke, allowing the engine to suddenly draw away from the tender, and he fell to the ground and was seriously hurt. The drawbar was made of iron, and was three feet long, four or five inches wide, and two and one-half inches thick.

He charged negligence of the company in allowing the drawbar to become weak and defective and in permitting its use while in that condition. On the trial the company contended that the evidence was insufficient to warrant a finding by the jury that there was any negligence in furnishing a defective drawbar or in failing to discover defects therein.

The plaintiff and several other witnesses testified that immediately after the accident they examined the broken drawbar, and that where it broke apart there was an old break or crack, about an inch and a fourth in depth, clear across the bottom of the bar. They said they could discern the difference between the old and the new break; that the old part of the break was "black, rusty, and scaly looking," and looked like it had been there a good while.

The defendant introduced quite a number of its employes, engineers, machinists, and inspectors, all of whom gave testimony to the effect that the engine in all its parts, including this drawbar, had been carefully inspected before the accident, and that no defect in it had been discovered. One of them, who showed expert knowledge of the subject, testified that, if there had been a flaw in the bar a fourth of an inch or more up through it from the bottom, it could have been discovered by a certain inspection.

There was a judgment for plaintiff, from which the defendant appealed. The Supreme Court of Arkansas affirmed the judgment in an opinion, in part, as follows:

"It is entirely beyond dispute that the testimony of the plaintiff and the other witnesses he introduced was sufficient to establish the fact that there was a defect in the bar at the time it broke and caused the accident. The only question is whether the evidence showed a defect which the defendant could, by proper inspection, have discovered, for under no other circumstances could it be held responsible for the injury that resulted. Negligence of the company cannot be inferred merely from the occurrence of the accident. That must be proved and the burden of establishing it is on the party who alleges it.

"The testimony of some of the witnesses shows that the break or crack in the bar was an old one; that it was about an inch and a fourth deep across the bottom of the bar, and was scaly, blackened and rusty from exposure, and had the appearance of having been done some time before. If this testimony is true, the flaw must have been in the bar when it was inspected, and one of the witnesses introduced by the defendant testified that the flaw could have been detected by a careful inspection. We think this was sufficient to justify a finding by the jury that there was an observable defect in the bar and that the defendant failed to exercise due care to discover it.

"It is true there is abundant testimony that the employes of the company made careful and rigid inspections and failed to discover any defect, but this was in conflict with the other testimony that there was a defect which should have been discovered, and the jury rejected it. They had the power to do so and we will not disturb the finding, even though we think it is against the preponderance of evidence. The question we have to determine is not whether the verdict was in accordance with the weight of the evidence, but whether there was evidence of a substantial character to support it. If there was such evidence it is not our province to determine its weight as that was for the jury.

"The facts of this case are not unlike those in the case of Spicer v. South Boston Iron Co., 138 Mass. 426, where the plaintiff, an employe of defendant, received an injury resulting from the breaking of an iron hook. There was evidence tending to show that after the accident a flaw in the hook was found which could have been discovered before if proper inspection had been made. The court held this evidence to be sufficient to sustain a finding of negligence; and said: 'There remains the question whether there was any evidence or negligence on the part of the defendant. That the S hook, by the rupture of which the injury occurred, was defective, was clearly proved. The master does not warrant to the workmen the safety of the appliances, but he is obliged to use all reasonable care consistent with the nature and extent of his business that such appliances are proper and suitable. He is not responsible for hidden defects that could not have been discovered on the most careful inspection. The testimony of Morrison that the hook now looked as if there was a break previous to the main break—of Harvey, that "if a man make a careful examination of the hook, after making it, he might perhaps have discovered the flaw which caused the accident, but these flaws would not be visible on an ordinary inspection"—the fact that there was actually a visible crack or flaw in the hook above the flaw at the place of the rupture, and that, as testified, iron will usually break in the weakest spot, taken together, tended to show that a careful inspection would have revealed the weakness of the hook.'

"There was also testimony in this case that the bar was so exposed that water could have run down into the crack and rusted it in a very short space of time; but the jury had these facts before them, as well as the appearance of the crack or flaw at the time it broke apart, and it was for them to say whether or not the defect or flaw was in the bar when it was recently inspected, and whether or not it was such a defect as should have been discovered by an ordinary inspection."

101 S. W. (Ark.) 738.

Computation of Duration of Life in Damage Cases.—In reversing a judgment based on a verdict for plaintiff for $800 damages in the case of Anderson v. Louisville & Nashville Railroad Co., where the administrator was suing to recover damages for the death of his intestate caused as alleged by the negligence of defendant, the Supreme Court of Alabama said:

"The court in its oral charge to the jury instructed the jury 'that, if they found that the plaintiff was entitled to damages, they might calculate on such sum as, being put to interest, will each year, by taking part of the principal and adding it to the interest, yield one-half of plaintiff's intestate's wages per annum, and as that the whole remaining principal at the end of 19.49 years, added to the interest on this balance for that year, will equal one-half of plaintiff's intestate's wages for that year, so there would be of the principal nothing left at the end of the 19.49 years.' This part of the court's oral charge was excepted to by the defendant. While the bill of exceptions does not so state, yet it is admitted by the appellant that the American Mortality Tables were introduced in evidence. But it is contended by appellant that the court erred in assuming and so stating to the jury that the deceased's life expectancy was 19.49 years. We think the court erred in this part of the oral charge. As was said by this court in the case of Mary Lee Coal & Ry. Co. v. Chambliss, 97 Ala. 171, 11 South. 897, these tables (mortality) 'are not conclusive upon the question of the duration of life, but they are competent to be weighed with other evidence. The physical condition of the injured person at the time of and next preceding the injury, his general health, his avocation in life, with respect to danger, his habits, and probably other facts, properly enter into the question of the probable duration of life.'"

43 So. (Ala.) 568.

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Naval Employes Get Increase.

About 1,000 employes of navy yards throughout the United States have recently received an advance in wages, ranging from 4 to 10 per cent. These employes include draftsmen, clerks and assistant inspectors, and the increase in compensation is provided for by the lump appropriations for the various classes of work in the several yards. The effect is to bring the rate of pay up to that of similar kinds of work in the other branches of the government service.

* * *

One Kind of Tariff Extortion.

A witness who testified at the tariff hearings before the Ways and Means Committee, and who advocated higher duties on his products, notwithstanding the fact that by his own acknowledgment his industry was very prosperous, is quoted by the Washington Herald, which gives the following colloquy between him and Mr. Underwood of the committee:

"Then why do you ask for an increase in the duties?"

"To increase our market," was the reply.

"Then it is not for protection, but that your profits may be increased?" continued Underwood.

"Well, that's what it boils down to," replied the witness with embarrassment.

On this the Herald says:

The consumer is entitled to that protection from high prices afforded by actual or potential foreign competition, and he ought not to be deprived of it in order to give another class of the community opportunity to make exorbitant profits. To the plea that higher duties should be granted to allow the extension of some domestic industry, we answer that foreign trade is just as important to the development of domestic manufactures as a protective tariff, and that if foreign trade is discouraged by prohibitive tariff duties, domestic industry will suffer in the same degree by inability to market its products abroad. "Reasonable profits," as the Republican platform phrases it, is all that the manufacturer is entitled to under a protective tariff. He is not entitled to a monopoly of the home market at high prices, nor is he entitled to make exorbitant profits. The consumer should be given a fair hearing in this revision, and he will be satisfied if the revisionists stick to the reasonable profits theory.

* * *

General Labor Notes.

Mine workers affiliated with the General Federation of German Trades Unions number 110,247 members.

Kansas City labor unions are getting out a union label bulletin every month, in order to keep members well informed in regard to all union labels.

Sixteen British trades unions, with a membership of 300,000, are supporting a movement to establish a one-cent eight page daily newspaper in the interest of labor. Its title will be the Morning Herald. The parliamentary committee of the Trades Union Congress will manage the venture. The suggested capital is $500,000.

Vice-Consul-General Charles A. Risdorf, of Frankfort, reports that at the commencement of 1908 the number of pensioners in the official insurance of the German Empire for invalids, old age, and sickness, amounted to 978,960.

Japanese laborers employed on the Hawaiian sugar plantations are agitating for an increase in wages.

The problem of dealing with the unemployed in the great centers of population in Great Britain is being considered by government authorities, all of whom agree that the number of persons out of work will be greater this winter than in many years.

The Japanese Government has raised the wages of artisans, engineers and shipwrights employed in the Government dockyards to 30 cents per day, which is the highest wage that has ever been paid to skilled workmen in that country.

Owing to the strike of cotton workers in certain parts of England, and which has resulted in a number of mills closing down, Philadelphia will also suffer a loss in a financial way by the stoppage of cotton exports.

A new German scheme of social legislation gives all workers a right to pecuniary aid when unfitted for work through sickness or accident. It is done by insurance, and made compulsory.

The agitation for the eight-hour day began in this country soon after its inauguration in Austria in 1856.

Chicago has a new paper published in the Hebrew language called the Jewish Labor World.

The Oakland, Cal., trades council has under consideration plans for the erection of a building trades temple to cost about $100,000.

A compilation of trades union statistics in the principal countries of the world place the number of members in good standing at 9,000,000, or 1,000,000 more than last year.

Louisiana, Connecticut, Nebraska, Indiana, Rhode Island, Washington, New Hampshire and Massachusetts, as well as Oregon, have the ten-hour day for women now in force.

E. W. Parker, chief statistician of the Geological Survey, asserts that much benefit will result from the action of Congress in appropriating $150,000 to investigate mine disasters.

Three music hall singers in Paris, France, have won suits for damages against the Electrical Workers' Union, for loss of work due to a two hours' strike of the union.

A writer in the Garment Workers' Bulletin makes the assertion that the struggle during the past twenty-five years for a reduction in the hours of labor has failed in only 39 per cent. of the cases involved, and that the eight-hour day is generally observed among twenty-five trades.

The Alaskan fisheries give employment to over 5,000 fishermen, the majority of whom are now organized.

The National Miners' Federation of France, with a total membership of 80,000 men, will soon affiliate with the General Federation of Labor.

The labor union movement in Canada, where many of the unions are closely allied with those in this country, has gained much ground in recent years. A report submitted by Consul Van Sant at Kingston, shows that there were 232 labor organizations formed in Canada in 1907.

American Federation of Labor organizers in every part of the country are giving particular attention to the formation of local women's label leagues to be affiliated with the Women's International Union Label League.

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Contributed

Trade Unions of Railway Employes in Switzerland.

At the end of 1906 there existed in Switzerland three unions of railway employes with a total membership of 25,701. The largest of these organizations was the Union of Employes of Swiss Transport Establishments with 16,482 members, or nearly two-thirds of the total number of organized railway men; the Workmen's Union of Swiss Transport Establishments had 6,500 members, and the Society of Swiss Trainmen had 2,719 members. In the course of the year 1907 the Locomotive Engineers, Firemen and Car Inspectors' Unions seceded from the Union of Employes of Swiss Transport Establishments, so that at the present time six trade unions of railway employes exist. Their membership on December 31, 1907, is shown by the following table:

Name of Union.	Number of Members.
Union of Employes of Swiss Transport Establishments	15,669
Workmen's Union of Swiss Transport Establishments	8,000
Society of Swiss Trainmen	2,988
Union of Locomotive Engineers	1,456
Union of Locomotive Firemen	1,874
Car Inspectors' Union	Unknown
Total	29,997

The first named union publishes two official journals, "Schrveizerische Eisenbahner-Zeitung" (in German language) and "Journal Suisse des Chemins de Fer" (in French language); both journals are issued weekly. The common journal of the Workmen's Union of Swiss Transport Establishments and the Society of Swiss Trainmen is entitled "Signal"; it is issued weekly, while "Die Lokomotive," the official organ of the Engineers and Firemen, appears only once a month.

H. Fehlinger.

Munich, September, 1908.

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Live Right.

In my previous remarks, which you had the kindness to publish in the August number, I made a brief allusion to parasites. Not wishing to impose too much on the Editor's time and patience, I refrained from pointing out how we are afflicted with many kinds of parasites and near-parasites; some existing because we are too indolent to clean them out, others being chronic, but all contemptible to the last degree.

My personal feelings and thoughts in the matter have found an echo in the expressions of several brothers, as appearing in the Magazine. Indeed, the latter is truly a storehouse for good, wholesome thought food; but the particular parasite who sponges on the labor and efforts of fellow-wage-workers, does not *seek* such food, and does not relish it if you force it upon him.

Do We Want Such Material?—To my mind if we strip the question bare it resolves itself into this. Is a man who is narrow-minded, shallow, cold-hearted and ignorant, a *loss* to our organization? Do we want or need him? If so, what for? Invariably the labor parasite will be found to possess one or all of the above characteristics. Narrow, for his mind has no room for the belief in the ultimate victory of justice, has no room for a sense of his duty as a man to aid with all his powers in the struggle for the right—too shallow and blind and perverse to see and acknowledge that, just as the tree which has no deep roots can not stand in the storm, just so would the world's hope for justice fall and perish should we all become such as he is.

My own answer is—no. We do *not* want such men in our Brotherhood. I know we do want and need money, we do want numerical strength; but, brothers, over and above, and beyond all, we want *character*. That lacking, our numbers will be as so much dust blowing around on a windy day. Now, I hold that a parasite is always such *voluntarily;* therefore, he has no character, no sense of obligation to his fellow-men, no thought of his relation to life and mankind in general, no sense of anything but his own worthless carcass, and any effort on our part to induce him to join the Brotherhood is simply labor expended in putting rotten timber into a vessel which we are building to withstand the storms of many years.

Some Few May Be Redeemable.—Do we *want* rotten material in our ship? There can be only one answer. We can not afford it. And right here I may remark that in this subject we may dig out and hold up for inspection a pretty strong and conclusive answer to all the mud slingers and defamers of organized labor—those hired and paid, and those conservatives who sit in their shells and tremble because the world moves, who cry about the arrogance and intolerance of "unions," this answer is found in the way we tolerate the parasite among us, even to extending our hand in friendship, because we are willing to live and let live, because we are unwilling to believe. until forced, that his attitude is one of choice; because we are loath to renounce until the very last our faith in human love of the right. And to some extent our faith is justified, for now and then a man who has been a parasite will, through the experience which the years bring, or through the hard knocks of fate, get his eyes open to his true position, and hasten to set himself right. But in the main a parasite will always remain one, though he often hides under a cloak of hypocritical excuses, to evade the contempt which he feels is his due.

Can't Find Life in Empty Shells.—No, brothers, we have far more important work to do than to spend our time and energy looking for life in empty shells.

The man who brazenly eats the fruit which is the result of the toil and effort of others, and in the production of which he refuses to aid, such a man can give us *no moral* support; his financial support would be the offering of a hypocrite, and to be spurned by sincere and earnest men, and though there may be some of you who will differ from me, I say again—*We do not want him.*

Now, as to the other side of the picture: Would it pay us, I wonder, to take an earnest look at it? Would it pay us to ask what, individually and collectively, are we doing to rob the parasites of every possible excuse for being such even temporarily? Let us answer this question honestly, and whatever there be to remedy, set about it without loss of time. What about the brother who in time of slack business holds his run down seven days a week, while his brother on the spare list is trying to support his wife and barefooted children on one or two days' wages per week? What about the brother who pays his dues promptly and asks—what more do you want? when it is interest and sympathy, and a live spirit, and backbone, and firm devotion to principle, and suppression of personal spite, which we *must* have if our organization is to be an oak with storm-defying roots, and not a rank, temporary weed on a common.

Great Changes Inevitable.—Don't tell me such is life and we must take our chances. I know well that life has burdens which are to be borne in silent resignation, just as it has burdens which only a coward will bear, but in the great total, life is what we all collectively make it. Great changes are coming, and great changes are always gradual; to the impatient mind almost imperceptible; to the mind weary with the struggle it is like walking with shackled feet through the hot sands of a desert, and to many of us, the handing over of cold cash carries in itself no meaning, no cheer and no promise. I am not the one to say we should tumble headlong over the rapids, if we are able to pick our way through along the bank. But I do say, unless we wage-earners awake to a clear realization of the fact that a great change is imperative among ourselves, a change in our mental attitude towards each other, and of our view of life, the day is surely coming when against the power of accumulated wealth, our empty hands will be as powerless as a crippled butterfly's wing.

Stand as One Man with One Purpose.—The inconsistencies and contradictions which are the source of ill-will and disappointment, the selfish delusion that there is more happiness to be found in gain than in service; all this must be gathered up and swept out like so much rubbish, unworthy of men who are to be the advance guard of a greater and better humanity. Truly, in the words of Walpole, the world is a comedy to those that think; and to those who feel, a *tragedy.* Let us not add to the comedy by showing the world that we can *talk* brotherhood, but not *live* and *act* it. Let us not add to the tragedy by forgetting that only with our own hands and brains can we gain our own by forgetting there is only one way in this life to gain it, to stand as one man, with one purpose, one aim. and to gather to our cause every man who is worthy, and such only.

"Justice Amongst Ourselves." — My plea is for justice among *ourselves*, that

there may be no uncertain note in our united voice when we demand justice from others. I plead for less selfishness, for the broader spirit that does not condemn all for the unworthiness of a few.

Let Us Add "Hope" to Our Watchwords.—The hand and voice of brotherly regard and charity and toleration will yet build works that shall stand as long as our race exists. We all make mistakes, but, to my mind, there is a sharp dividing line between those who learn from their mistakes and those who do not learn, and this line divides the real men and the fools. Here we can judge with safety the doctrine of the fools and fossils; we all know that these things will always be, because they always *have* been. I have heard this sentiment expressed more than once by men who would count it a deadly insult should their intelligence be questioned. Yes. Wealth *will* always rule, but wealth of *mind*, not wealth of gold and coin. Did I not firmly believe this, were not my faith in this so absolute and final that I am able to draw a veil of forgetfulness over the tragic history of man's inhumanity to man, I should lose my hope, and, brothers, for the loss of hope there is no compensation in this world. To the watchwords of our Brotherhood let us add "Hope." If we are able to hold closely to them all through the struggle, all will be well with us, and though our stay here as individuals may be too short by far to reach the goal, if we have helped to break a pathway through ignorance, greed and injustice, if we have set our children—your children and mine—hand in hand in a united purpose on this path with the light of our experience to lead them, don't you think, brothers, when our heads are white with the frosts of many years, we may calmly fold our hands and say, and feel it—"I have lived and not in vain."

C. W. LUNDBERG,
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New London, Conn.

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Miscellany

The Canadian Board of Railway Commissioners—Canada's Interstate Commerce Commission.

In an able and instructive address delivered at a banquet given at Stratford, Ont., by the Board of Trade of that city, on November 5th last, Hon. Justice Mabee, Chairman of the Board of Railway Commissioners of Canada, explained the duties and powers of the Board and its relation to the public and the railways, etc.

Mr. Mabee spoke as follows:

In Canada, prior to the Railway Act of 1903, there was practically no Government control over the operation of railways. In that year an entirely new departure was made in Canadian legislation affecting the railways subject to the jurisdiction of the Parliament of Canada. The draughtsmen of the Act had at least two sources to draw from in framing its provisions: The earlier one being the English legislation, embodied now in the English Railway and Canal Traffic Act, which in various forms had been in force in England for nearly fifty years; and the Interstate Commerce Act in force in the United States. Canada, however, went much farther than did the Mother of Parliaments, or Congress, and we have today in our Railway Act of 1906, with its subsequent amendments, statutory provisions of a much more advanced and far reaching character than are found in the railway legislation of any other country of the world. Doubtless Congress would have been found willing to go quite as far, possibly farther, but owing to the peculiar, and I might say (in this respect) unfortunate constitution of the United States, it had not the jurisdiction, without encroaching upon the power delegated to the States, and so their federal legislation is necessarily confined to interstate railway matters.

It is, of course, quite impossible in any brief space of time to compare the provisions of our statute with those of England or the United States, and I shall content myself, and possibly tire you, by dealing very shortly with some of the provisions that will probably be of the most interest to you.

Its Provisions.

I quite appreciate, gentlemen, that you form the commercial and industrial life of a city of very rapid growing importance, and probably you will be more interested in those clauses of the act dealing with the tolls that the railways are allowed to charge, and the power to control them that is vested in the Board of Railway Commissioners which the statute called into existence.

Of course you know that this act gives to the Board power over the location of lines of railway, of branch lines, sidings and spurs, stations and station grounds, the crossing of railways, both by highways and other railway lines, both steam and electric, as well as all manner of protection devices at crossings and elsewhere, limiting the speed of trains for the safety of employes, and the use of all sorts of safety appliances, control over rolling stock, signals, structures and works, and generally for the carrying into effect of the act.

The findings of the Board upon any question of fact are final and conclusive, and the Board is not bound in finding the facts by the judgment of any other court. There is an appeal to the Supreme Court upon questions of jurisdiction, if such appeal is allowed to be taken by a judge of the Supreme Court, and upon a question of law if leave for such appeal is granted by the Board; and the Governor-in-Council may alter or rescind any order of the Board.

Method of Procedure—No Red Tape.

Elaborate and exhaustive machinery is provided for working out all these various matters; the Board hears evidence, the parties appear by counsel, agent, or in person, as they desire, the proceedings are informal and although certain rules are in existence the public is in no way held down to them, and in most instances a letter from a man having a grievance is accepted as a statement of his complaint. To this the company complained against makes answer, if the case requires evidence it is heard in due course; if no evidence seems necessary, a formal disposition is made of it simply upon the complaint and answer. No technicalities of any kind are allowed to intervene to prevent quick substantial justice from being done. There is no red tape, and although the Board endeavors to assume the dignity that its importance as the people's tribunal demands, it does not make dignity one of its most prominent features.

Highly Qualified Assistants and Inspectors.

There are a chief and three assistant engineers, all eminent in their profession, and these gentlemen inspect and approve of plans, inspect roadbeds, crossings, and attend to all engineering features connected with the proper construction and maintenance of the railway and its works. No road can be opened for traffic without their inspection and approval, and the approval of the Board, and upon their condemnation the Board could order any railway to cease operating its trains upon its lines, or any of them, or require any sort of improvement in roadbed, rolling stock, bridges, or otherwise, that might be thought proper in the interest of public safety; and these engineers may, after inspection, if in their judgment such step is proper, forthwith forbid the running of trains, and this prohibition may be ratified or removed by the Board.

Power to Compel Accommodations.

Power is given to the Board to compel railway companies to furnish adequate and suitable accommodation for receiving, loading, carrying and delivering all traffic, without delay and with due care and diligence; and to furnish all proper appliances for so receiving, loading, carrying, and delivering all traffic; and this accommodation includes facilities for private sidings, together with the placing and moving of cars on these sidings. Control is given over the movement of all trains, and the carrying of all kinds of freight, including the proper loading of it.

The Board has five equipment and accident inspectors, all experienced railway men, whose duty it is to inspect rolling stock and investigate all kinds of accidents, making reports to the Board, with suggestions as to improvement in protective devices with the view of protecting property and lessening the liability of accidents, both to the public and to those whose duty it is to man and operate the trains in transit.

Jurisdiction Over Telephone, Telegraph and Express Companies.

In this hurried review I have dealt with but a few of the more prominent features of the Board's work; many other matters incidental to the operation of railways are confided to its care, but time prevents a reference to them; but in passing let me say that it has jurisdiction over telephone, telegraph, and express companies, including the tolls charged, connections to be made, approval of tariffs and the like.

All Must Be Treated Alike.

As I have already said, perhaps it is to manufacturers and shippers and commercial men, as most of you are, that the tariff clauses of the act are of greater interest, as in these days of fierce competition between individuals, and between localities, freight rates and facilities for shipping and delivery of freight are of supreme importance. In many cases the difference between rates, as between different localities upon various commodities, represents the margin of profit to the producer or shipper. The act prohibits any attempt upon behalf of the carrier to make unreasonable charge for carrying freight, and requires that the tolls shall always, under substantial and similar conditions and circumstances, in respect of all traffic of the same description, and carried in or upon the like kind of cars, passing over the same portion of the line of railway, be charged equally to all persons, and at the same rate, whether by weight, mileage, or otherwise, and that no reduction or advance in any such tolls shall be made, either directly or indirectly, in favor of or against any particular person using the railway, and that no toll shall be charged which unjustly discriminates between different localities.

All companies are required to afford to all persons equal facilities for moving traffic, and are prohibited from giving undue or unreasonable preference or advantage to, or in favor of any particular person, or any particular description of traffic or by any unreasonable delay or otherwise making any difference in treatment in receiving, loading, forwarding, unloading, or delivering goods of a similar character in favor of or against any particular person, or any particular description of traffic to any undue or unreasonable prejudice or disadvantage in any respect whatever; and are required to so distribute or allot their freight cars so there may be no unjust discrimination against any locality or industry, or against any traffic which may originate upon their railways destined to a point upon another railway in Canada with which they connect.

Evils Removed.

Prior to the Act of 1903 there were supposed to exist, and possibly did exist, many conditions that worked to the disadvantage of certain persons, and localities, which have been prohibited by that legislation, and now every sort of discrimination or favor, by rebate or otherwise, is opposed to the spirit as well as the express provisions of the act. No one individual can have a rate that is not open to his neighbor or competitor. The railway companies fix their tolls and file their tariffs with the Board for approval, and once these have the sanction of the Board they become the tolls by force of the statute. They are all subject to disallowance by the Board, if unjust or unreasonable or contrary to the provisions of the act, and the Board may require the company to substitute a tariff satisfactory to it, or prescribe other tolls in lieu of those disallowed.

Kinds of Tariff.

Three kinds of tariffs are provided for by the act.

(a) Standard Freight Tariffs.
(b) Special Freight Tariffs.
(c) Competitive Tariffs.

The standard freight tariff must specify the maximum mileage tolls to be charged for each class of freight classification for all distances covered by the companies' lines, and these distances may be expressed in blocks or groups, and these may include relatively greater distances for the longer than for the shorter hauls.

Special freight tariffs are required to specify the tolls lower than those in the Standard tariffs to be charged for any particular commodity or for each and any class or classes of the freight classification, or to or from any certain point or points on the railway, and greater tolls are prohibited in those tariffs for a shorter than for a longer distance over the same line in the same direction, if such shorter distance is included in the longer.

Competitive freight tariffs must specify the tolls lower than those in the standard freight tariffs to be charged by the company for any class of the freight classification, or for any commodity or commodities to or from any specified point or points which the board may deem or have declared to be competitive points, not subject to the long and short haul clauses of the act.

When these tariffs are approved, the companies have to publish them twice in the Canada Gazette, and until the provisions of the act are complied with the companies are prohibited from charging any toll whatever. These tariffs are required to be kept for public inspection at all stations where freight is received for carriage thereunder, and in this way all persons having occasion to use them are expected to obtain a knowledge of their provisions, and as no other rates can be charged or permitted than those provided for in them, it behooves every shipper to make himself familiar with the contents of these tariffs, as he can obtain no redress in case of mistaken quotations. The tolls provided for in these tariffs when once appoved and published can be changed or altered by no one except by a legal cancellation and filing with the board.

Traffic Department's Duties Difficult.

The traffic department of the board consists of a chief traffic officer and several assistants, all skilled railway men and having large experience in tariff making.

You will see from these brief references to the statute that parliament has endeavored to place all upon an equal footing, both as to the facilities to be afforded them by the railways, as well as the tolls to be paid for these services; and one of the most important duties of the Railway Board is to see that these provisions are lived up to. Perhaps there is no more difficult work that we are called upon to undertake than that arising out of the tariff clauses of the Railway Act. The framing of tariffs involves the consideration of such a multitude of perplexing conditions that it seems an impossibility to evolve tariffs that are scientifically accurate and absolutely fair. Those whose duty it is to prepare these tariffs for the railways naturally come in for a good deal of criticism from those who are called upon to pay the tolls, and yet from the cases we have been called upon to consider, arising under these tariff sections, it is proper for me to say that I have found that they have been prepared with an honest intention of carrying out the law.

Companies Comply With Spirit of Act.

Self-respecting and able men have charge of these matters for the railways, and while it is only human nature that their endeavors should be in the interests of their employers, yet their work upon the whole has been to comply with the spirit of the act, and to frame a scale of charges that are reasonable, at least from their point of view; of course we are not always able to agree with them, but when we have differed I incline to the belief that there was room for honest differences of opinion. Endeavors to carry out the provisions of the law, although not always succeeding, are much to be preferred than attempts to set the statute at naught, and from all I have observed since I have been a member of the board, I think those who have charge of the management of the railways have been endeavoring to live up to the law.

Difficult Problems Yet to Be Solved.

Our statute has only been in effect five years, and there are many and difficult positions and problems yet to be settled and solved. With the rapid extension of railway lines in Canada, new conditions are developing almost daily, and the application of the statute to the active operation of the road has to be effected with the greatest possible care and discretion; it is an actual truth that the prosperity of the country and that of the great railway systems in it are closely linked together, and while it is the duty of the Railway Board to see that the public is fairly, properly and considerately treated by the corporations, it is equally its duty to see that the latter get fair play and justice, and so long as I have the honor of presiding over this tribunal it shall be my endeavor to see that the rail carriers and the public each get even-handed treatment.

Favors More Rapid Development.

The commission has under its jurisdiction nearly twenty-five thousand miles of railway lines, and the mileage, as you well know, is increasing rapidly and must for many years to come continue to increase. I am not at all in accord with those who think the country is overbuilding in railways. Of course we can only move so fast, but I should like to see a still more rapid development in transportation facilities, both by rail and water.

I am sure no well-informed man thinks that with the completion of the lines at present under construction leading from the west, the output from that country can be taken care of for the next ten years. Before, I think, long before, that time additional outlet must be provided not only by land but by water. Whether this will be by double tracking or otherwise the future alone can solve.

A few weeks ago I met a party of engineers just leaving Winnipeg for Churchill; they were prepared to spend the winter near there. They were to be engaged in surveying a line to a good port upon Hudson Bay. That a road will run there in the near future is an assured fact, but to what extent that route can provide for the transportation of grain to the markets of Europe is a question that is surrounded by such conflicting information, as well as varying conditions, that only actual trials can settle. My confidence in the permanent and productive success of the Canadian West is so great that my belief is that a Hudson Bay route and three transcontinental railways will not be able to provide for the traffic to and from that country for the next ten years, and if anyone thinks I am too optimistic let him journey through Manitoba, Alberta and Saskatchewan and see the development going on there. We are simply repeating what took place in the United States during the last few years, only our advance will be more rapid because we have a more attractive and better West; and it is the East that has the greatest at stake in providing the easiest, quickest and cheapest transportation for the produce and people of the West. Lack of proper transportation facilities check growth and development, and this lessens the demands upon the manufacturers of the East. Just as the peopling and settlement of the western states built up and enriched the factories in the Atlantic states, so the factories of Ontario and our eastern provinces will be enlarged and kept busy by the demands made upon them by the wants of the people of our western provinces.

Stratford, with its busy hum of factory life, is especially interested in these matters. The manufacturers here know full well what their western business now means; but, gentlemen, it has only just begun; it will keep increasing year by year; of course the lean years will necessarily make their unwelcome appearance occasionally, but the demands upon your factories will increase as the years roll along, with the retention and increase of this business, the transportation of your products to the consumer, and of his to the markets where he sells, along the shortest and cheapest routes is the all important question, and with the cost of this transportation, at least so far as the land carrier is concerned, and under certain circumstances with the water carrier also, during the years to come the Dominion Railway Commission will probably have much to do. It is to be hoped, in the interest of all concerned, it may perform its functions wisely.

Prior to its last session the board consisted of three members; by the act of this year it has been increased to six. One of our number, I am sure you were all pained to hear, died on Tuesday last. The Hon. Thomas Greenway had been a long time in public life and at one time represented in the House of Commons a riding adjoining this county, and in earlier years was well known in this city. He had not undertaken work upon the commission before his death.

The Railway Act as we now have it is by no means a completed piece of legislation; it has its defects and will require many amendments before it will be in the condition I would like to see it. It is, however, a good workable law as it stands, and is sufficiently elastic to meet varying conditions.

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The Alaska-Yukon-Pacific Exhibition.

Press dispatches state that from the present indications it is practically certain that the Alaska-Yukon-Pacific exposition to be held in Seattle from June 1 to October 15 of this year will have the distinction of being the first world's fair to be completed in every detail by the opening date.

According to official figures just given out the construction of the buildings and grounds is now seventy-five per cent complete. Three of the permanent buildings, to become the property of the University of Washington at the close of the fair, the auditorium, fine arts and machinery hall, are entirely complete.

The plans for the federal buildings have been approved, and contracts for the construction will be awarded within the next thirty days, with a time limit for completion set for March 1, 1909.

The grounds are in excellent shape, even at this early date. A large section of the green lawns has already been laid out and a number of the winding paths have been completed.

There are more than a million plants now in the greenhouses ready for transplanting.

With ceremonies typical of the North, the Arctic Brotherhood recently dedicated its building site at the grounds of the exposition, and construction has been started on the building which will represent the old-time Alaska road houses. The structure will be entirely of logs, and one of the novel features of the dedication ceremonies was the hauling into place of the first log by an Alaskan malamute dog team.

The building is to be one of the permanent structures. At the close of the fair it will be used as a museum for the University of Washington for Alaska curios, and will also be the fraternity house for university students coming from Alaska.

The last obstacle to the success of the exposition was removed when the sale of $350,000 worth of exposition bonds was completed recently. After having subscribed to $850,000 worth of stock the people of Seattle responded promptly to the appeal for additional funds, and the $350,000 was raised within ten days after the canvass was started.

With this additional fund on hand the scope of the construction of the buildings and grounds was at once enlarged, and every portion of the work is being rushed with greater rapidity.

All exhibits shipped to Seattle for the exposition from foreign countries will be admitted to the United States free of duty.

It is said the greatest floral display ever shown at a world's fair will be exhibited at the Alaska-Yukon-Pacific Exposition in the landscape gardening of Olmstead Brothers.

Old Slouch Hat.

Old Slouch Hat, you've got to go;
You are battered and tattered and worn, you know,
And the holes in you let the north wind through
And the sun, and the rain, and the hail, and the snow.

Old Slouch Hat, we have pardners been
For three long years, through thick and thin.
At the end of each trip I have yet to fail
To hang you up on the same old nail.
You were carefully dusted and thoroughly brushed,
And you've never been knocked about or crushed;
I've treated you white, and that is flat—
Haven't I, now, you Old Slouch Hat?

Old Slouch Hat, I've stuck to you,
And you to me, and we've both been true.
Once I lost you along the track,
But I advertised and got you back.
Twice I've fished you out of a wreck—
'Cause you've kept the cinders off my neck.
'Tis small, unimportant things like that,
That count in the long run, Old Slouch Hat.

Old Slouch Hat, they laugh at us,
Do the boys, and say, "He's a queer old cuss;
On local freight or passenger run,
Daytime or night-time or rain or sun,
He still wears that Old Slouch Hat right along,
Tho' new ones are selling for most a song."
But we didn't care for things like that,
Did we, my pardner, my Old Slouch Hat?

Old Slouch Hat, you were with me that day
We came down the hill in the runaway;
The day we ran into that open switch—
The day the rails spread and we went in the ditch.
You were with me the day that air hose burst,
And of all our mishaps, that was the worst.
And I wore you the day I had the chat
With the first vice-president, Old Slouch Hat.

Old Slouch Hat, you sure must know
'Tis hard to say that you must go;
But don't think for a moment I'll throw
you away;
On the wall I will hang you and there
you can stay.
I know you'll be lonesome, and that is
no joke,
For you'll sure miss the cinders, the coal
dirt and smoke,
The mountains, the blue sky, the valley
and flat,
But myself worst of all, my Old Slouch
Hat.

—LYDIA M. DUNHAM.

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Texas State Library Receives Historic Mementoes.

A pen and a gun are amongst the possessions recently added to the Texas State Library. The pen is the one used by President Roosevelt on May 30, 1908, when signing the Act of Congress granting pensions to the Texas Rangers for services before the war between 1855 and 1860, and the gun the one with which Color Bearer James Day was armed when he was killed while carrying the colors of the First Texas Infantry in the Battle of Sharpsburg, Md., on September 17, 1862. The weapon was presented to the library by James P. Wintermyre, of Shepherdstown, W. Va. What adds special interest to this memento of southern bravery is the fact that after Color Bearer Day was killed the colors were raised by four other men until one after another they were also killed, the regiment losing 183 of the 216 men with which it went into the fight.

State Librarian, Bro. Joseph Myers, reports that a large list of valuable new books has also been added to the library.

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What Consumption Costs—The Awful White Plague.

Dr. Irving Fisher, Professor of Political Economy at Yale University, and Chairman of the "Committee of One Hundred" of the American Association for the Advancement of Science, in one of his papers before the recent International Tuberculosis Congress, states that consumption (tuberculosis) costs the people of the United States more than one billion dollars a year.

The American Association for the Advancement of Science has for a long time been engaged in propaganda work for the increase of national health by the elimination of preventable diseases.

It is claimed by Dr. Fisher that 138,000 persons die of consumption every year, and that in each case the loss of earnings and cost of medical attendance before death, averages at least $2,400, and that if to this is added the amount of money that might have been earned had the patients been in health, the total loss in each case is about $8,000.

The Great White Plague gathers most of its victims from the inmates of the haunts of poverty, whose lives are spent in overcrowded and ill-ventilated homes and workshops. It usually attacks young men and women about the time they enter the army of wage-earners. Dr. Fisher estimates that it cuts off their earning power for about three years before they die.

The time has arrived when every organization that has for its object the betterment of humanity should engage in a fierce battle against this dreadful scourge which is costing so dearly in life and treasure.

Many of the working class going from heated factories to their homes, often a mile or more distant, perspiring, and in many cases insufficiently clad—their vitality, impaired from overwork and lack of proper nourishment, being at its lowest ebb—fall easy victims to the Great White Plague.

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The Evils of Intemperance.

The following are interesting facts bearing on the excessive use of alcohol, which The Scientific Temperance Federation, in its crusade against the liquor habit and kindred evils, brings to light:

The Early Formation of the Drinking Habit.

The importance of the early education of children and youth to habits of sobriety was shown by a study of 275 alcoholic cases in Bellevue Hospital reported in the Bellevue Medical and Surgical Report for 1904, by Dr. Alexander Lambert.

Of 259 instances where the age of beginning to drink was known, 4 began before 6 years of age; 13 between 6 and 12 years; 60 between 12 and 16; 102 between 16 and 21; 71 between 21 and 30; and 8 only after 30 years of age.

Thus nearly 7 per cent. began before 12 years of age, or the seventh school year; 30 per cent. began before the age of 16, and over two-thirds—i. e. 68 per cent.—began before 21 years of age. If these statistics are representative of general conditions, they indicate clearly that preventive temperance work to be effective must be begun at an early age and carried on thoroughly through childhood and youth.

The reasons for acquiring the habit are significant in indicating lines along which preventive work should be done. False social ideas led to drinking for the sake of sociability in 53 per cent. of the cases; a desire to dull the sense of misery, as recommended by Prof. Münsterberg, in 12 per cent.; the use of alcohol as medicine in 9 per cent.; parental example or influence in 5 per cent.

Most of the alcoholics, Dr. Lambert finds, drink for the narcotic effect, either to obtain the feeling of well-being and indifference to their environment or to seek oblivion, and like all narcotics, alcohol begets a craving for more.

The training of children and youth to assist sobriety must, therefore, definitely teach the dangers in alcoholic drinks due to their nature, must emphasize the value of abounding health based upon intelligent observance of hygienic laws, must stimulate courage and self-control in meeting temptation, and must fill life with resources so that youth will not be dependent upon low types of sociability for enjoyment. The complemental external conditions imply removal of temptations to drink from the way of young people, the securing of healthful homes and public environment, and the providing of opportunities for innocent recreation and fellowship.

Industrialism and Drink.

The use of alcohol to drown trouble and to make a man forget the worries of the day, as suggested by Prof. Münsterberg, is not favored by the industrial leaders in Germany and Austria. A resolution passed at the Fifth Industrial Congress held at Vienna (October, 1907), declared that alcohol weakens the thinking power of the laboring man so that he is not in a condition to consider means of bettering his condition, and that in that country alcoholism is one of the greatest hindrances to the physical and mental advancement of the working classes. This Congress resolved, says Der Abstinent (June), to engage in an active campaign of lectures and literature to teach the people the destructive consequences of the use of alcohol for the workman and his family.

The War Against Opium.

The joint commission on the opium traffic appointed by the countries who have possessions in the East, viz., Great Britain, Germany, France, Portugal, the Netherlands, China, Japan, and the United States, is to meet in Shanghai, China, January 1st, 1909. Meanwhile, the American Commissioner, who is working in the United States, Mr. Hamilton Wright, Washington, D. C., is endeavoring to find out how much opium is used legally and illegally in this country. Physicians, boards of health, and police departments are asked to send him any authentic information they may possess to aid his inquiries, the results of which will be studied at the joint meeting in Shanghai for the purpose of arriving at some practical plan for international control of the opium traffic.

The figures already collected by Mr. Wright show that there is a marked increase in the amount of smoking opium imported, although our Chinese population has decreased. At the time of the Vancouver race riots, two opium manufacturers presented claims for damages to their business at the rate of $100 a day. It is estimated that there are 5,000 white opium smokers in New York City alone, and over 100,000 in the United States.

"It would be a serious deprivation," says the Journal of the American Medical Association (Aug. 22), "if the world should lose the medicinal and pain-stilling uses of opium, but its absolute suppression would be a small price to pay if by it only could the evil as it exists in China be checked."

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*"Vox Populi, Vox Dei."**

It has long been acknowledged that "the voice of the people is the voice of God." The undiscerning may hear in the people's voice only a great roar of discontent, or the mutterings of the misguided mass. But he who has understanding will hear the "still, small voice," which speaks the will of God.

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*By the Rev. Charles Stelzle.

The statesmen in every age who have accomplished the things which have produced the greatest good for all the people, got their inspiration because they kept close to the masses. Rarely does the vision come to the man who spends all of his time in the seclusion of the study. His touch on life is so slight, and his understanding of the needs of men so inadequate, that his outlook extends only to the limits of his own life and his own narrow experience. It is only as a man comes into contact with others that his own life becomes larger and fuller, and it is out of this fulness that he is enabled to speak concerning the greater problems of life.

No class of men have a broader experience than the "common people"—no class knows quite so well what it means to toil and to suffer and to sacrifice. None have higher aspirations and none exhibit deeper consecration. It is because of this that God speaks through them.

Sometimes their expression of God's will is crude. Sometimes it comes as a shock to men who have become accustomed to things as they are, who, quite satisfied with present conditions, are unwilling to be made uncomfortable by a change which may mean a readjustment in their method of living and in their way of doing business. But to stand in the way of progress is futile. It may be that it is necessary to oppose certain features—man-made and man-inspired—which have crept into the plans which the people present, but back of them all and beneath them all will be found the hand of God.

This has been proven in history. In every great fight for the right and for progress, the leisured classes, the so-called upper classes, have been on the wrong side of the battlefield. The common people—the men of uncommon sense—to these the world owes a debt of gratitude.

If you would hear the voice of God, keep close to the people.

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An Innovation.

A prominent New York firm is authority for the statement that a "Bureau of American Manufacturers in Europe" has recently been organized to fill a need of American manufacturers for better facilities abroad, and is open to all reputable American firms. The bureau has rented a large six-story building in the business heart of London, Eng., and foreign buyers visiting that city will be invited to attend the exhibition of American goods, which will be carried permanently. All facilities for corresponding with buyers, etc., etc., will be maintained, as well as a staff of experienced salesmen; also writing rooms and other up-to-date office appointments.

According to a statement issued by Postmaster Morgan, of New York, the new two-cent rate of postage put into effect October 1st last, between the United States and the United Kingdom, has already had the effect of increasing the volume of such foreign mail one hundred per cent.

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What Typhoid Costs.

During his speech on the "Conservation of Life and Health by Improved Water Supply," at the White House conference last May, Dr. George N. Kober presented some interesting figures to show that the decrease in the "vital assets" of the country through typhoid fever in any single year, is more than $350,000,000. Polluted water is mainly responsible for the spread of typhoid, so that the general purification of city drinking water will very materially reduce the death rate from this disease. Dr. Kober quoted statistics to show that an efficient filtration plant resulted in a saving of $475,000 per year to the city of Albany, of which $350,000 may be considered a real increase to its vital assets, the typhoid fever rate in that city having been reduced from 104 to 25 in every 100,000 of the population through the use of its filtration plant. According to Census Bureau figures the average annual death rate of typhoid in cities having contaminated water supplies has been reduced from 69.4 to 19.8 per 100,000 by the substitution of pure water supplies. During the course of his address Dr. Kober cited estimates to show that the average length of human life in the 16th century was between 18 and 20 years, and that at the close of the 18th century it was a little more than 30 years, while at the present time it is between 38 and 40 years, and that the span of life since 1880 has been lengthened on an average of about six years.

Drought Increases Typhoid.

An approximate increase of 10 per cent. in the number of typhoid fever cases in the State of Indiana for last November over those of the corresponding month of the preceding year, is attributed by Dr. J. N. Hurty, Secretary of the State Board of Health, to the drought of the late summer season, and which affected almost all of the sources of water supply in the territory where it prevailed.

"In dry weather," said Dr. Hurty, "a well, after having exhausted its supply of water from the immediate surroundings, begins to draw from a more distant source and is more likely to supply contaminated water."

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The Experiences of a Locomotive Foreman's Wife.

Did it ever strike you that the wives of the locomotive foremen on these great railroads of ours are persons of importance, and have many strange experiences brought about by the men who work under their husbands in the shops or on the road? We hear of the trials and tribulations of the wife of the king, president, politician, minister and doctor, but who ever yet aired the experiences that come to the well-named "better half" of the man who keeps the railway company's rolling stock in order and takes the abuse of his seniors, whether he deserves it or not.

As I am the wife of a locomotive foreman on one of the Canadian roads and have seen a great deal of railroad life, I thought a short article on my own experiences would be of interest to the readers of the B. of L. F. and E. Magazine.

In the first place we have been moved from place to place until I can pack my household effects in the dark, and even the family dog knows the use of a packing box and hunts up his collar and chain from force of habit. The parting from friends has got to be an old experience, and I always keep a box of cards marked "P. P. C." on hand. The much-talked-of misfortunes of the Methodist minister who has to move at least every four years are light when compared to those of the locomotive foreman. The minister always has a few months' notice and then goes to a home prepared for him, but the foreman comes home at six o'clock with a telegram to the effect that the master mechanic has decided to transfer him to ———? perhaps twenty-five miles or perhaps half way across the continent, and he will please go by next train, and by the next train he goes and his wife has the packing to do and the family to look after until her long-suffering "hubby" gets settled in his new sphere and hunts up a house. The parting is very hard, and though the friends we are leaving are not of long standing, still they are very dear to us, and that feeling of utter loneliness and depression that comes to the stranger in a strange home is only one of the trials of the foreman's wife.

Then we have our little f(r)iend—"please leave out the 'r'"—the call boy, who comes all hours of the night and who seems to take a special delight in pulling the door bell out by the roots and waking all the dogs in the neighborhood, and loudly informing the sleepy man who answers the door that "the 68 is called for six o'clock and fireman Brown has booked sick, and who shall they call in his place." Perhaps three or four times in the night our "knight of the lantern" calls until, unable to get to sleep again, I lay and meditate on the work of the coming day until it is time to get up and do what my tired brain has been planning all night; and then there are the spoiled evenings and interrupted family gatherings and lonely walks to church caused by engine No. something getting stuck on the turntable and the sudden demand for the foreman's presence at the scene of the mishap.

One evening shortly after we were settled in the town of E——— I was waiting for my husband to come home from the shops, as it was close on to ten o'clock, when one of the firemen hastily rang the door-bell, and when I opened the door he told me that one of the engineers had been killed in the yards and he wanted me to go with him and break the news to the unfortunate man's wife. As I was a stranger to her I suggested going for a minister, but the young man said they had thought of that and had decided that a woman would be the best one to go, as she would know better what to do and say, and my husband had told him to come for me. Of course I went with him and stayed all night with the young widow, who had only been married a few months and was a stranger in the city.

On another occasion a machinist who had shortly before come from the East and obtained employment in the shops had gotten a leave of absence for a short time that he might go back and help his family to get ready to move to E———. With his wife and little ones he arrived in the city on Wednesday evening, and on Friday morning died suddenly of heart failure, leaving his family of six children among strangers and with hardly enough food in the house to see them over the day. Again was I called, and long will I remember the days of sorrow and trouble that hung over that heart-broken woman. With the help of the neighbors I did all I could until the suddenness of the blow had worn off and the affairs of the poor man were settled.

First into one home and then another I have gone, and whenever my husband hears of sickness or sorrow he is always sure of my willingness to help in any way I can, and I may safely say that we have never yet left a place where we did not carry the good-will of the railroad people with us, and some of my dearest friends are those who stand at the throttle or firebox of the engines or work in the roundhouse on the C——— Railroad in the West.

LULU JUNE.

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How Do Forest Fires Start?—Forestry in Japan.

In view of the awful conflagrations that have been recently occasioning such deplorable loss of life and wealth through the destruction of forests in the United States and Canada the question naturally arises, "How do forest fires start?" To which the United States Forest Service replies in the following interesting reference to the subject:

"What starts these forest fires?" This question has been asked over and over again this summer by readers of the accounts of the destructive fires which have been raging in all parts of the country.

Campers and locomotives, is the usual answer. Many of the other things which start blazes in the forest are forgotten. It is true that perhaps one-half to three-fourths of the forest fires do begin as a result of the carelessness of some camper, or from sparks flying from locomotives, but there are a number of things which set the woods a-fire.

A complete report of forest fires in the private forests of the country and their causes is not kept by anyone. Uncle Sam, however, is most careful to account for the damage done by the blazes on his timberland under forest administration, aggregating about 168,000,000 acres, and each year the total area burned over, the timberland burned over, the amount of timber destroyed and its value, the cost of fighting fires, and the causes of fires are carefully checked up. These reports are made at the end of the calendar year, and the announcement of this year's losses will therefore not be known for more than two months.

Last year's figures, however, give a good idea of the things which cause fires in forests. Of the 1,355 fires discovered on the National Forests last year, all of which were checked by the rangers before they had burned over fourteen hundredths of one per cent (14-100 of 1 per cent) of the National Forest area, campers caused 346, while railroads followed next with 273; lightning came next, with 176; donkey engines used in lumbering operations, fourth, with 65; careless brush burning by homesteaders clearing land, 34; fires caused by incendiaries and those set by herders and hunters, 30. For more than 400 of the fires the cause is not known. This is not strange when it is remembered that a fire may smolder for days, if the air is too thick to permit the smoke to be seen at a distance before it breaks out when fanned by a wind so as to reveal its presence to the watchful forest officer.

While campers caused more fires than locomotives last year, there are many reasons why the railroads hold undisputed claim to first place. Forest fires started by both are mostly unnecessary. If campers would exercise care in starting camp fires and be sure that they are extinguished before they are left, and if the railroad companies would use the most modern and efficient spark arresters, it is reasonable to think that the annual forest fire loss could be reduced more than one-half.

Lightning ranks third among the causes of fires, and of course, man has no greater responsibility in this case than to put the fire out as soon as possible after discovery. Careless brush burning by homesteaders and persons clearing land is said to be the cause of many of the fires which have started this year, particularly those which have swept over the lake states.

The ranger force on many of the National Forests has been kept busy fighting fires which, if left to run unchecked, would have done incalculable damage. By quickening communication between important points through the construction of telephone lines, and building roads and trails, the National Forests have been made more accessible during the past two years and fire fighting has been greatly facilitated.

Forestry in Japan.

Just at the time when this country is beginning to struggle with the problem of husbanding its forest resources, of protecting its mountain slopes, and of improving the waterways, it is interesting to know that the Japanese have successfully attacked the same problem, before the land suffered severely from the evil effects following deforestation. The far-sighted people of Nippon have foreseen the results of the destruction of their extensive mountain forests, and have safeguarded themselves by placing all of these under government control.

The practice of forestry has been carried on in Japan for a longer time than in any other country. For 1,200 years the people of Japan have been planting and growing forests, with a success that has been a little short of marvelous. Under careful management, the Japanese forests yield very high financial returns. This high yield is only made possible by the close utilization of every bit of the tree so that scarcely a twig is wasted, and by the improvement of the growth of their forests by carefully conducted thinning and tending. The woods are first thinned at the age of thirteen years, and then every five years after that up to the time of the final harvest, at 120 years.

It was with the opening up of the hitherto inaccessible mountain forests that the Japanese government became most intensely interested in forestry. The mountains were still government land, so all that was necessary to protect them was to place proper restrictions on the sale and cutting of timber. This was effected by declaring the forests on the steep slopes as reserved forests, in which the only cutting should be done under government direction. The forests on agricultural lands, not needed for protection, are classed as available forests, and here the cutting is not so carefully restricted.

Thus Japan has effectually prevented the stripping of her mountain slopes before any great damage has been done. In some districts, where the mountains are near the towns, the steep slopes have already been cleared, and this has resulted in floods and the washing down of the soil from the slopes on to the farm lands. But these cases have been exceptional, and have merely served as a warning, which Japan has heeded before it was too late to prevent widespread destruction.

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Knew the Sex.

It was evidently her first trip to the hair goods department of the great emporium and she was noticeably embarrassed.

"I—er—wish to look at some—er—false hair," she stammered.

"Very well, miss," rejoined the diplomatic salesman. "What shade does your friend wish?"—Exchange.

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Preparing for Winter.

"Yes," said old Graspitt, "I'm always willing to help the unfortunate. Here's 2 cents—now don't spend it for drink."

"Shure I won't," answered the unlaundered hobo. "I'll blow de most uv it fer a suit uv silk underwear an' a ticket t' Florida."—Exchange.

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The Exceptions.

"A woman," observed the home-grown philosopher, "can keep a secret as well as a man can—with the possible exception of two kinds."

"And what are they?" queried the innocent bystander.

"Those that are not worth keeping and those that are too good to keep," exclaimed the philosophy dispenser.—Exchange.

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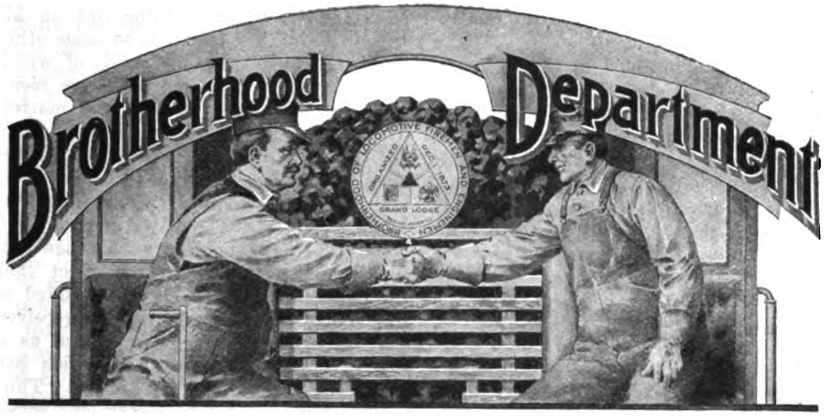
According to Contract.

House Owner—"You failed to pay your rent last month. What are you going to do about it?"

Tenant—"Oh, I suppose I'll do as you said when I rented it."

House Owner—"What did I say?"

Tenant—"You said I must pay in advance or not at all."—Exchange.



A Word to the Wise Is Sufficient.

A number of legislative bodies throughout the continent are now in session, or will be in the very near future.

In their fight for just and equitable legislation for railroad employes legislative representatives of railroad labor organizations have already experienced opposition from fellows who, although holding membership in one or another of those organizations, are willing to violate their obligation and betray their fellow employes in exchange for an official smile of approval or possibly something more substantial. Under one excuse or another these creatures appear before committees of legislative bodies and declare that the legislation being sought by our Legislative Boards is neither equitable nor desirable.

In support of such declarations they cite their railroad experience and even use their connection with the particular Brotherhood or order to which they happen to belong.

Such fellows are not entitled to social recognition amongst railroad men, much less to membership in their organizations, which fact is recognized by those organizations to the extent that they have made provision for their expulsion when their treachery is proven.

Our own Brotherhood took action in this particular at the Milwaukee Convention (1906) by the enactment of a law (Section 226 of the new Constitution) providing that when it has been proven that any member "in any manner interferes with matters pertaining to state, territorial or national legislation affecting the interests of its members, without the approval and written consent of the regular Legislative Representative," he shall be expelled.

In his department in this issue the international President has called special attention to this section of the Constitution, and if there is in our entire Brotherhood a man who could be induced to betray the interests of our Order by in any way obstructing the work of our Legislative Boards, it may be well for himself individually to heed this warning, although the Brotherhood would be better off without him.

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A New Sub-Department.

Commencing with this issue a new sub-department will appear in the Magazine as a feature of our Brotherhood department. This new sub-department will bear the title "From The President," and through it the international President will each month speak directly to the members.

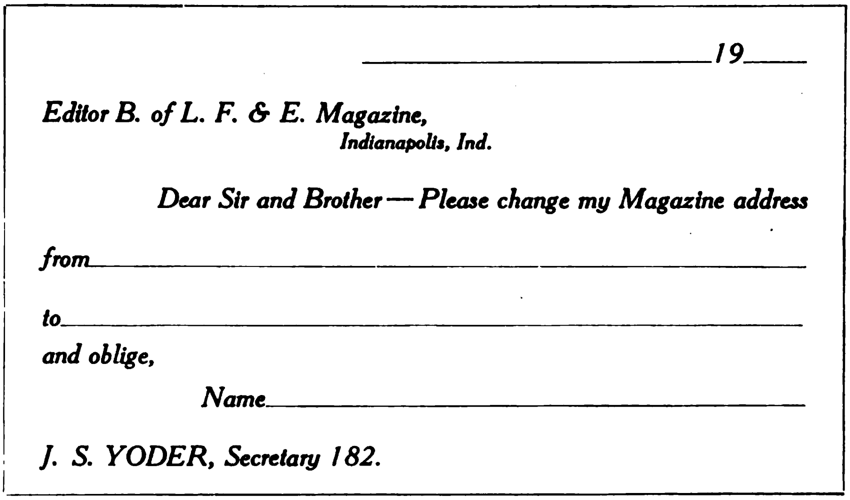
Another sub-department, which will take the place of "Brotherhood Bulletins," will also appear in the Magazine, commencing with this issue. It will be known as "From the General Secretary and Treasurer," and will be conducted by the General Secretary and Treasurer, who will use it as a medium through which to bring to the attention of the membership matters of special interest relating to his department.

The matter contained in these departments will be of deep interest and concern to every member of the Brotherhood, and we feel confident that all brothers will co-operate so fully and so earnestly with the international President and General Secretary and Treasurer as to amply justify and reward them for their work in maintaining these departments.

* * *

An Excellent Idea.

A private mailing card containing notification of change of address for a brother of Lodge 182 has recently been received from the secretary of that lodge, and as the general use of such cards by all lodges would constitute a most effective facility for keeping the Editor promptly notified of changes of address and thus insure the uninterrupted delivery of the Magazine to members after moving from one residence to another, we publish a reproduction of it herewith. The card which is printed is as follows:



______________________19_____

Editor B. of L. F. & E. Magazine,
Indianapolis, Ind.

Dear Sir and Brother—Please change my Magazine address

from______________________________________

to____

and oblige,

Name_____________________________

J. S. YODER, Secretary 182.

On the other side is printed the address of the Editor and Manager.

A large percentage of our members advise the secretary of their lodge of their changes of address and depend on him to notify the Editor and Manager. Often they happen to meet and so notify the secretary when he is going out on his run or giving his attention to some other important business, as a result of which he may omit making the necessary memorandum and thus overlook the matter. The member being under the impression all the time that the Editor and Manager has been advised of his change of address by the secretary, gets impatient after he fails to receive one or two copies of the Magazine at his new address, and writes in to the effect that notwithstanding we have been notified of his change of address he has not received his Magazine since moving, when, as a matter of fact, no such notification has ever reached the Magazine office. Thus explanations become necessary, and sometimes as many as four letters are exchanged regarding the matter before it is adjusted, all of which could be avoided by the use of one of these simple little postal cards at the right time.

If all lodges would keep a supply of such cards on hand a great deal of such unnecessary correspondence would be avoided and the number of postmaster drop notifications would be reduced to a minimum; but what is still more important—our members would be saved the annoyance and disappointment of failing to receive their Magazines.

By keeping a supply of these cards on hand in the lodge room a member when desiring to have his address changed could get one from the secretary while attending lodge. It would take but a minute for him to fill the card out and he could mail it on his way home, thus insuring prompt notification.

The secretary could always keep a few of these cards in his pocket, and when happening to meet a brother wishing to have him notify us of his change of address, he could hand him one, and instead of the secretary waiting to reach home to write a letter to the Editor and Manager, the member himself could fill the card out with a lead pencil and in all probability have it mailed in the course of three or four minutes.

The action of Lodge 182 in adopting this very convenient and effective method of notifying this office of changes in the addresses of its members is indeed commendable, and if the same plan is adopted by every lodge most desirable results will follow.

For universal adoption the Editor and Manager would specially recommend a form of card as follows:

______________ 19____

Editor and Manager B. of L. F. & E. Magazine,
Indianapolis, Ind.

Dear Sir and Brother—Please change my Magazine address
from ______________
to ______________
and oblige,
Yours fraternally,
Name ______________ *Lodge, No.* ______
Office held by me at present, ______________

If holding an office, be sure to give name of office.

Secretary ______________

It will be observed in this latter form of card that provision has been made for lodge officers to give the name of the office they hold when notifying the Editor and Manager of a change of their address. The reason for this is to insure prompt change of their address in the Directory also.

It is deemed advisable not to have the name of any officer of the lodge printed on the card, because where a lodge would have a supply of such cards on hand it might lead to confusion after such officer had discontinued to hold that office. When the secretary of a lodge would fill out such a form card as the one we suggest, he could make it known by signing his own name in the blank provided for it. For a couple of dollars a supply of such cards could be purchased that would last a lodge for a long time.

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Change in Date of Publishing Directory.

Owing to the many changes that are made in the Directory each quarter it is necessary that the corrected copy be in the hands of the printer not later than the 10th day of the month preceding the date of issuance. Consequently in the past it has been impossible to get more than a small proportion of the changes occasioned by an annual election recorded in the next issue of the Directory immediately following such election. For instance, it was necessary to close the issue of the Directory dated August 1st, on July 10th. Inasmuch as subordinate lodge elections were held at the last regular meeting in June, we received notification of but a small percentage of the changes resulting from those elections by that date (July 10th). Hence the August Directory contained the names and addresses of more ex-officers of lodges than of those holding office at the time it was issued, and the names and addresses of all new officers could not appear until the November issue of the Directory was published, or for a period of four months or more after they were elected.

Under the provisions made by the Columbus Convention, viz., that the Directory be published on the first day of the third month of the quarter, instead of on the first day of the second month of the quarter, ample time will be given to permit of the names and addresses of all new officers elected at the annual election of officers appearing in the issue of the Directory next following that election, particularly as annual elections will take place under the new constitution at the first regular meeting of the lodge in the month in which they are held, instead of at the last regular meeting, as heretofore.

The next issue of the Directory will be published March 1, 1909, and will be corrected up to February 10th, and succeeding issues will be published on the first day of March, June, September and December of each year.

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Wise Enactments.

None of the legislative enactments of our recent convention (Eleventh Biennial, Columbus, Ohio,) will contribute more to the success and prosperity of our Brotherhood than its action in establishing a uniform rate for all insurance policies; providing for the monthly payment of dues and including "the loss of one eye" in the list of disabilities for which the full face value of beneficiary certificate is paid.

Flat Insurance Rate.

By the establishment of a uniform insurance rate per thousand, anything that might appear as discrimination against those brothers carrying Class E ($3,000) policies has been discontinued and a rather prolific source of complaint removed.

Monthly Payment of Dues.

The monthly payment of dues has many advantages; prominent amongst which may be mentioned that the obligation to make a monthly settlement with the Financial Secretary (formerly Collector) is suggested by a member's visit to the pay car. Under the old plan it was necessary to look out for the month in which dues were payable, and there was possible danger of its being overlooked. Under the new law, however, this danger will no longer exist, and as the members will in a short time become used to paying their dues each month much of the additional work occasioned the Financial Secretary by the new method will be compensated for.

Payment of Insurance for Loss of One Eye.

Payment of the full face value of beneficiary certificate for the loss of one eye has long been advocated by a large percentage of our membership. While there are several disabilities for which our Brotherhood pays the full face value of its policies that are not included in the disability lists of other organizations, the fact remains that at least in one other Brotherhood the full amount of a member's insurance policy has heretofore been paid for the loss of one eye. No comparison in this particular, however, can be made any longer to our disadvantage. for by adding this disability to our list we have still further increased the number for which we pay insurance over and above that of any other organization.

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Reports of Legislative Boards.

The Eleventh Biennial Convention, realizing that valuable space in the Magazine is wasted by publishing unnecessary details in the reports of Legislative Boards, enacted legislation providing that no more than four pages of the Magazine be hereafter devoted to the publication of the report of any legislative board.

All legislative board reports that receive space in the Magazine must be given in condensed form, and correspondence and other unnecessary details eliminated. When necessary to refer to the subject matter of correspondence, same should be given in substance only, and as briefly as possible.

Harry W. Belnap Appointed Vice-Grand Master B. of R. T.

By the resignation of P. H. Morrissey, Grand Master of the Brotherhood of Railroad Trainmen, effective January 1, 1909, and the consequent promotion or moving up of his subordinate officials a vacancy has been created in the list of Vice-Grand Masters. To this vacancy Bro. Harry W. Belnap has been appointed.

H. W. BELNAP
Vice-Grand Master, B. of R. T.

For nearly ten years Brother Belnap has been a member of the Board of Grand Trustees of the B. of R. T., having been elected to that position by its New Orleans Convention in May, 1899, and chosen to succeed himself at each convention since then.

Brother Belnap has for a number of years served as inspector of safety appliances for the Interstate Commerce Commission, and in this capacity has been instrumental in bringing many suits against railroad companies for violations of the safety appliance law, which suits resulted very beneficially in the interest of safer railroad operation. Brother Belnap has been an energetic and sincere worker in the interests of his Brotherhood ever since joining its ranks in July, 1892, and his appointment as Vice-Grand Master is a well-merited recognition of his faithful and efficient service.

Our Help Appreciated.

Bro. James H. McVety, Secretary-Treasurer of the Federated Trades of the Canadian Pacific Railway, has issued a statement of the donations to their strike fund received from various sources, and has written the Editor requesting that the numbers of our lodges contributing thereto as well as the amounts donated by them, be published in the Magazine. In his letter Bro. McVety says: "I desire on behalf of the men to thank your membership for the magnificent donation made by your last Convention, and also for the number of grants made by local lodges on this system."

Bro. McVety's statement shows the following amounts received from our Brotherhood:

From—	*Amount.*
Grand Lodge Convention	$2,000
Lodge 262	50
Lodge 333	20
Lodge 305	100
Lodge 262	40
Lodge 321	30
Lodge 479	50
Lodge 521	25
Lodge 747	10
Toronto Junction, Ont.	50
Total amount received	$2,375

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Sparks.

The more completely a road is organized, the more effective will be the work of the organization on that road.

Commence now to get that 90,000 for St. Paul by getting every man who is eligible to membership in our Brotherhood to join its ranks.

Every railroad man should have a chart showing the No. 6 ET Locomotive Brake Equipment. Same can be procured for 15 cents, together with printed matter descriptive of its workings. All orders should be sent to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Don't forget that commencing March 1, 1909, the Directory will be published and sent out the third month of each quarter, instead of the second month of each quarter, as has been the case for some years past. Full particulars are given elsewhere in this issue of the Magazine.

It should be the aim of every member of our organization to say that our Order embraces in its membership 100 per cent. of the men on his system who are entitled to hold membership in its ranks.

We still have on hand a few bound volumes of the Magazine for 1907. Those desiring to secure a bound volume should send $2.50 to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind. For this amount these books are sent prepaid to any part of the United States, Canada or Mexico.

Notwithstanding that it has been continuously announced in the Magazine that we cannot publish anonymous communications, they continue to come in. Every letter for publication sent to the Magazine office must bear the signature of the writer. If so desired the name will be withheld upon request to that effect, but as evidence of good faith the communication must bear the writer's name. Otherwise it will not be published.

Bro. Henry Herman, of Lodge 232, advises that he has back copies of the Magazine since 1892, all in first-class condition, of which he is willing to dispose. There are sixteen volumes in all. Interested parties can secure full information by addressing Henry Herman, 97 Grand Ave., Middletown, N. Y.

All notifications of changes of names or lodge officers and their addresses, as well as of changes of meeting places of lodges, or dates for meetings, should be sent direct to the Magazine office.

Bro. Walter R. Young, acting secretary of Lodge 752, Marmarth, N. D., writes the Magazine office that their lodge is growing rapidly, and that it now embraces a territory spreading over 750 miles.

Any one desiring to secure back copies of the Magazine may be able to procure them by corresponding with Mr. George Gesner of Alliance, Ohio, as he writes us that he has copies for September, October, November and December, 1891; complete year for 1892; 1893 with exception of the month of March; 1894 with the exception of January; 1895 with the exception of January and February; 1896 with the exception of December; complete year for 1897; 1898 with the exception of November; 1899 complete, with extra copy for December; 1900 with the exception of February and December.

The change in date of issue of the Directory from the second month in each quarter to the third month in each quarter, is bound to prove more satisfactory to our membership. See full particulars elsewhere in this issue of the Magazine.

Bro. L. G. Russon, of Lodge 120, advises that he has a complete file of the Magazine beginning with the number for January, 1884, of which he is willing to dispose. Interested parties can secure further information by writing L. G. Russon, 162 Green Ave., Detroit, Mich.

Those brothers who have already purchased a copy of the Catechism of the Electric Headlight have found it to be of the greatest value to them in their efforts to thoroughly acquaint themselves with the operation of that most important locomotive appliance. Don't fail to get in line. Fifty cents sent to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind., will bring a Catechism to you by return mail.

Brothers, remember that you are paying for the protection and improved conditions of the non-Brotherhood man who is eligible to membership in our Order, and that it is only right that he bear a fair share of the expense of maintaining these advantages by joining its ranks.

All changes for the Directory, both in names of officers and their addresses, dates of meetings, as well as place of meeting, etc., should be sent without delay direct to the Editor and Manager of the Magazine. The co-operation of all brothers in this matter would insure accuracy and permit of our issuing the numbers of Directory with absolute correctness.

Promptness in notifying this office of your change of address will insure the uninterrupted monthly visits of your Magazine. All communications should be directed to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

FROM THE PRESIDENT

The Outlook.

We begin the year 1909 with a most promising opportunity to greatly increase the membership of the Brotherhood of Locomotive Firemen and Enginemen. There is not a lodge that cannot find plenty of good material for new members almost at its door.

Just why we have overlooked this material in the past is not readily understood, unless it be that we have devoted our energy and attention to other things that seemed to us of more importance.

What could be more important to a labor organization, or to a fraternal insurance organization, than to absorb all of the "new blood" possible? It seems to be a fact, however, that in some localities the present members of subordinate lodges have become indifferent to the work of securing new members.

The President and all of his associates will soon undertake a great organizing movement, with the purpose in view of enlisting all available and desirable material in the work of our Brotherhood. It is to be hoped that the lodges will even anticipate the work of the Grand Lodge officers by immediately seeking to secure applications of all persons who are eligible to membership.

Present Industrial Conditions.

If we are to believe those who are supposed to know, the prosperity which railway companies and their employes enjoyed for several years will soon again make itself felt. During the recent Presidential campaign working people were told that if certain things happened there would be no cause for the reduction of wages, and that the mills, mines and workshops would soon be as busy as they ever were during the best days of the recent prosperous period.

That "event" has happened and, as predicted, we learn of the restoration of "full time" in many industries. Railway securities are now selling in Wall Street at prosperity prices and every one seems optimistic.

While all should add their mite to the cause of prosperity by optimism, the fact remains that we know when our employing railway companies are handling the traffic they did before the recent so-called panic. So long as all of the men, who were suspended on account of the slack business are not re-employed, and all are not making full time, we can question that prosperity has again returned in full measure. A leading banker and dealer in investment securities has this to say of financial and industrial conditions in a monthly bulletin for December devoted to those interests:

"'Conservative optimism' is quite as much in order now as it was months ago, when conditions making for the revival of business were but just beginning to manifest themselves. We should beware of infection from that overenthusiasm which revels in booms, but notes not those slow steps which inevitably must be taken before the process of business restoration is complete. The jubilations of the enthusiast today, stimulated possibly by the rise in prices on the Exchange, are quite liable to give place tomorrow, even under slight provocation, to direful predictions as to the future, and weak repinings that recovery is lagging sadly. No importance should be attached to either, for it is neither from the heights nor the depths that the real situation is determined. It is a matter of record that the march of improvement not only has been, but is being, well maintained, and is even more rapid than could reasonably be expected, in view of the severity of last year's crisis and accompanying panic. For many reasons a swifter recovery would have been undesirable, and especially might undue haste have proved fatal to those delicate readjustments so essential to the complete and right settlement of our difficulties. Of more importance than any other one thing is the continuance of that uninterrupted progression which has been the chief and most gratifying feature in the rehabilitation of our commercial and indutrial life.

"Only the captious will grumble at the results thus far achieved. Without going into details, it is only necessary to point to the net earnings of the railroads—those for September surpassing the same month of 1907; to clearing house operations for November—the highest since October, 1907; to the fact that while steel operations are as yet only about 65 per cent. of normal, the average of other industries has advanced to at least 80 per cent.; and to the further fact that domestic trade has nearly regained a complete equilibrium. If further evidence as to the restoration of confidence be desired compare the average price of railroad stocks of last month with the highest boom prices of November, 1906, and a difference of only about fifteen points will be found.

"What could argue more strongly for an ultimate enlargement of business than the condition of our money market? At home our financial position is all that could be desired, while abroad it is exceedingly strong, by reason of our enormous favorable trade balances. Even excessive gold production, that much debated factor of uncertain power, is for the moment apparently aiding in the upbuilding process.

"But gratifying as are these recoveries from the distressing situation of little more than twelve months ago, and sound as are present conditions, they should produce only conservative optimism—none but the thoughtless are likely to be misled by them into the folly of enthusiastic extremes."

Legislative Work of the Brotherhood.

In many States lodges of the Brotherhood have availed themselves of our laws which provide for the creation of State Legislative Boards. In some of the States great good has been accomplished in securing the enactment of legislation which has for its purpose the protection of the lives and limbs of railway employes, and also for the purpose of relieving railway employes of the burdens of iniquities which have descended to us from the English courts through what is known as the "common law."

The State Legislative Board of Texas has been exceedingly fortunate in securing much remedial legislation, and it would be well for those who are interested to correspond direct with Bro. Joseph S. Myers, Box 77, Austin, Texas, who is the present Chairman of our Legislative Board of that State, and who has been closely connected with all of the legislative actions of our organization within recent years.

There seems to be a general demand for information concerning the action of our recent Convention relative to affiliation with the American Railway Employes' and Investors' Association. It so happened that when this matter was disposed of by our Eleventh Biennial Convention I was en route to Peoria on business connected with the Convention, and, therefore, must depend upon the printed proceedings for all information concerning the action of the Convention relative to the matter.

On pages 370 to 374 of the printed proceedings is found an outline of the plans and purposes of this new legislative or political movement, and it would be well for those interested to read all that is said therein. As copies of the proceedings have recently been sent to secretaries of all lodges, this information will be easy of access to all of our members.

On page 811 appears the report of the Committee on Welfare of the Order, in which report the committee practically referred the entire matter back to the Convention for disposition. The following, however, is the action of the Convention relative to affiliation with the American Railway Employes' and Investors' Association:

"Motion, That it is the sense of this Order in Convention assembled, that we join with the three other railway orders, so far as the welfare of our Order is concerned: Provided, That the said association will favor the passage of laws abolishing the inhuman doctrines of fellow-servant and assumed risk, and such other laws as will protect the interests of railway employes."

Another question that has often been before the Grand Lodge for consideration is the rights of members of this Brotherhood to independent political and legislative action. In the past it was sometimes found that when a bill was introduced upon request of our legislative boards, no matter how just and desirable, there always could be found some members who were willing to personally appear before legislative committees and testify against the bill. Because of the prevalence of that practice in some States, the Milwaukee Convention enacted Section 235, which section remains as Section 226 of the new Constitution, and is as follows:

"Any member of the Brotherhood who in any manner interferes with matters pertaining to state, territorial or national legislation affecting the interests of its members, without the approval and written consent of the regular legislative representative, shall, upon conviction, by written information furnished by such regular qualified legislative representative, same being duly sworn to and a copy thereof forwarded to the international President, be expelled: Provided, however, He shall be entitled to the right of appeal through his lodge within thirty days after notice of expulsion. If the charges are sustained at the final hearing the expelled member shall be forever excluded from membership in the Brotherhood."

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FROM THE GENERAL SECRETARY AND TREASURER

As this is my last opportunity as Grand Secretary and Treasurer to speak a word through the columns of our Magazine, I desire to express my gratitude to the secretaries, treasurers and other officers of subordinate lodges, who have so kindly aided me in my work at the Grand Lodge office.

I ask that this same courteous treatment be extended to my successor, Brother A. H. Hawley, who assumes the duties of General Secretary and Treasurer on January 1, 1909.

Yours fraternally,
W. S. CARTER.

Payment of Assessments.

Attention is again called to the fact that no Grand dues or quarterly dues are hereafter collectible from members.

Beneficiary assessments, beginning March 1, 1909, will be levied directly upon the membership, Beneficiary Assessment No. 1 being payable on or before April 1st. Collectors, now known as Financial Secretaries, will be required to pay same to the Treasurers on or before the fifth day of each month, and to report to the General Secretary and Treasurer at Peoria, Illinois, all expulsions for nonpayment of assessments.

Treasurers will be required to remit the amount of all beneficiary assessments collected on or before the 20th of the month, to the General Secretary and Treasurer at Peoria, Illinois.

If it is the desire of a lodge to "carry" a member it will be necessary for the Treasurer to draw upon the private funds of the lodge, instead of using portions of the assessments collected from other members, as in the past.

No more Grand dues are collectible. General Fund Assessments of twenty-five (25) cents per month take the place of Grand dues, and the amount collected by General Fund Assessments must be paid by the Financial Secretaries to the Treasurers on or before the fifth day of each month, and the Treasurers must remit same to the General Secretary and Treasurer on or before the 20th of the month.

Local assessments are collected monthly from all members in a sum not less than twenty-five (25) cents a month. The money received from local assessments will be paid by the Financial Secretary to the Treasurer on or before the fifth day of each month, and will become a part of the General Fund of the lodge.

Where lodges have fixed local assessments at twenty-five (25) cents per month, all members will be required to pay to their lodge the following amounts monthly:

Class of Members.	Gen'l Fund Assess'nt.	Beneficiary Assess'nt.	Local Assess'nt.	Total.
A ($1,500)..	25 cents	$1 65	25 cents	$2 15
B ($1,000)..	25 cents	1 10	25 cents	1 60
C ($ 500)..	25 cents	55	25 cents	1 05
D ($2,000)..	25 cents	2 20	25 cents	2 70
E ($3,000)..	25 cents	3 30	25 cents	3 80

Where lodges place their local assessments at more than twenty-five (25) cents per month it will, of course, increase the total amount to be paid by each member.

It was hoped by the Convention that the changing of the law so that each member would know positively that he would be compelled to pay the Financial Secretary of his lodge a certain fixed sum each and every month, would very materially lessen the number of expulsions, and that it would no longer be necessary for lodges to "carry" so many members.

It is also understood that instead of members waiting for financial secretaries to call upon them for these amounts, that every "pay-day" they will immediately send the amount, that they know is due the lodge, to the Financial Secretary.

Double Beneficiary Assessment.

The attention of all members is especially called to the provisions in our new laws which require the payment of a double Beneficiary Assessment on or before April 1, 1909. Under the old law "quarterly dues" for three months would be payable in advance, and no more would have been collected until the end of the three months, and members who failed to pay at that time would be expelled for nonpayment of dues and assessments, and could not be readmitted without a medical examination unless within thirty days, and in the event of their death after their expulsion their insurance would have been void.

Under the new law each member pays a double beneficiary assessment on or before the first day of April, 1909, and a regular beneficiary assessment on or before the first day of every month thereafter. Failing to pay such beneficiary assessment at any time, as required by the law, results in the expulsion of the member without any act of the lodge. The fact of his failing to pay is in effect a member expelling himself.

In consideration of the payment of this double beneficiary assessment on or before April 1, 1909, the Brotherhood agrees to pay the full amount of the beneficiary certificate to a member expelled for non-payment of assessment, or to his beneficiary, should he become disabled or die, as provided in our laws, within thirty days after such expulsion. In addition to this the Brotherhood agrees to the readmission of any member who was expelled for the nonpayment of assessments within a period of sixty days after his expulsion without a medical examination, provided he is in good physical condition, and provided the application is made to the General Secretary and Treasurer, as required by our laws. The adoption of this law was for the purpose of protecting members who, through carelessness or no fault of their own, became expelled for the nonpayment of assessments, and it is believed that all members will recognize the advantage of the change in the law.

Attempted Impositions on the Brotherhood.

There seems a disposition upon the part of members of subordinate lodges to favor each other rather than the Brotherhood in questions of doubt affecting insurance interests. This disposition is noticeable in matters pertaining to the payment of dues and assessments and pertaining to the expulsion of members for the nonpayment of such dues and assessments.

There are several instances during recent years where members have "disappeared," and immediately other members of the same lodge requested or demanded that the insurance be paid, "because the member had disappeared for a period of seven years," or for some other reason satisfactory to themselves.

Two or three years ago a member of a Canadian lodge had "disappeared" for a period of seven years, and the death claim was filed and a request was made for the payment of the claim. The beneficiaries of the missing brother asserted that they were positive he was dead, because of the manner in which he disappeared, etc.

Efforts were made to discover the whereabouts of the missing brother, who was located in Kansas City, Kansas, running a stationary engine, which made it evident that he had attempted to defraud this Brotherhood, or had deliberately abandoned his family.

On June 21, 1907, the Secretary of Old Kentuck Lodge 584 (now defunct), addressed a letter to this office, enclosing newspaper clippings from the "News and Press" of St. Joseph, Missouri, which set forth the fact that one Robert P. Shadoan, a member of that lodge, had apparently committed suicide by jumping from the Grand Island bridge at St. Joseph, Missouri, on May 30, 1907. This report of suicide was based upon the finding of a hat, presumed to have belonged to Robert P. Shadoan, and also the following letter addressed to the Chief of Police of St. Joseph, Missouri, bearing date of May 30, 1907, which letter was found on the bridge and would indicate that Robert P. Shadoan had suicided by jumping into the river:

ST. JOE, MO., 5-30-1907.

"To those who find this:

Here is where I say my prayers, so good-bye, relatives and friends. Meet me in Heaven, where there is no more grief. ROBERT SHADOAN.

P. S.—This is nobody's fault but my own. Don't blame anybody.

SHAD."

The fact that our laws had been changed, so that we were no longer required to pay insurance when the presumption of death of a member was based upon his disappearance, led the G. S. and T. to refuse to entertain this claim. The Secretary of Old Kentuck Lodge 584, and the attorneys who were employed by the wife and beneficiary named in the certificate of this member, were urged upon to secure some positive proof of the death of Robert P. Shadoan.

Nothing further developed in the matter until, under date of November 2, 1908, a letter was received from the Secretary of Lodge No. 90, at Enid, Oklahoma, in which he advised that one Robert P. Shadoan, once a member of Old Kentuck Lodge 584, wanted to become a member of that lodge. Correspondence was immediately taken up with former members of Old Kentuck Lodge 584, and it has developed that said Robert P. Shadoan was seen in Lexington, Kentucky, during the months of August or September, or a long time after he was presumed to be at the bottom of the Missouri River.

The feeling of fraternity seems to be stronger among members of our Brotherhood than is generally found among members of fraternal insurance associations, for upon inquiry I learn that in other organizations the members are more inclined to defend the organizations against imposition, rather than to support questionable or unreasonable claims against the organization. If every member would call to mind his obligation of loyalty to the Brotherhood before he undertakes to press a questionable claim against the Brotherhood, or to make requests or demands that expelled men be restored to membership illegally, the expenses of our membership would be materially reduced.

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A Monument for Our Late General Counsel.

On November 9th the Grand Secretary and Treasurer mailed to the secretaries of all lodges the following letter:

"PEORIA, ILLINOIS, Nov. 9, 1908..

Dear Sir and Brother—I herewith enclose you printed extracts from the proceedings of our Convention relative to the proposition to erect a monument over the grave of Bro. John H. Murphy, our late General Counsel.

You will note by reading same that the Western Federation of Miners, for which organization Bro. John H. Murphy was also General Counsel, wishes to join with this Brotherhood in the erection of this monument. I have received a communication which indicates that they have $1,000 for this purpose, and I believe that this organization should raise a like amount, and therefore this letter is addressed to you by direction of our Eleventh Biennial Convention, soliciting funds for the erection of this monument.

It has been suggested that the quickest and easiest way to raise this fund would be for each lodge to contribute $1.50 as promptly as possible. If, however, any member of your lodge desires to contribute this amount, or you desire to take up a subscription for this purpose, your judgment should prevail. I believe, however, that nearly all lodges will immediately remit the $1.50 for this fund.

When this subject is presented to your lodge I hope that you will read the printed matter so as to note the worthy cause for which this money is raised, and I feel sure that the amount suggested herein could not be appropriated for a better purpose.

When your treasurer remits this amount for this fund please ask that he use great care in keeping it separate from other remittance, and in notifying this office that the money is remitted for this purpose, so that the proper receipt can be issued therefor.

Thanking you in advance for your assistance, I remain,

Yours fraternally,
W. S. CARTER,
Grand Secretary and Treasurer."

Enclosed with the foregoing letter was the following extract from the proceedings of the convention:

"MONUMENT TO BRO. J. H. MURPHY, PAST GENERAL COUNSEL.

(From Page 802, Proceedings of Eleventh Biennial Convention.)

Concerning this subject we, your Committee on Ways and Means, find that the following matter has been referred to us for our consideration:

Motion by W. F. Hynes, delegate of Lodge 77.

Seconded by P. A. Lynch, delegate of Lodge 75.

Whereas, The Western Federation of Miners at their annual convention held in Denver, Colorado, last July, gave power and authority to the President of that organization to make such arrangements as in his judgment would be meet and proper to erect a suitable monument to the memory of our late brother, John H. Murphy, the cost to be determined later; and

Whereas, The Western Federation of Miners has purchased a large, handsome site in the most beautiful cemetery in the city of Denver, called 'Fairmount,' where the remains of our late brother are interred, and have invited the Brotherhood of Locomotive Firemen and Enginemen to join them in the erection of such a monument; therefore, be it

Resolved, That we authorize the Grand Master to act with the President of the Western Federation of Miners for the purpose mentioned, and that an amount be and is hereby appropriated sufficient to meet one-half of the cost required to construct and erect such a monument.

Referred to Committee on Ways and Means.

RECOMMENDATION OF COMMITTEE.

After giving due consideration to the foregoing matter, we respectfully submit the following recommendation:

From the foregoing resolution, supplemented by argument before your committee by Bro. W. F. Hynes, of Lodge 77, and P. A. Lynch, of Lodge 75, we, your committee, respectfully request permission to submit the following report:

While we sincerely mourn the loss of our Past General Counsel, Bro. J. H. Murphy, we cannot with justice to the organization recommend the establishment of a precedent such as the disbursement of Grand Lodge funds for the purchase of a monument would be.

We have carefully read over previous convention proceedings and can find no instance where Grand Lodge funds were disbursed for this purpose; on the other hand, we find that in each instance where such was proposed same was rejected by the convention. *We, however, do recommend that our Grand Secretary and Treasurer be instructed to send out a circular letter to all lodges in the Brotherhood and solicit a contribution from them for the purpose of assisting the Western Federation of Miners in the purchase of this monument to the memory of our deceased Past General Counsel, J. H. Murphy.*

Such funds as may be collected in this way by the Grand Secretary and Treasurer shall be forwarded to the committee in charge of the erection of the aforesaid monument.

Motion by G. St. Louis, delegate of Lodge 442.

Seconded by G. Coan, delegate of Lodge 441.

That we adopt report of committee.

Adopted.

On December 12th collections have been made as follows:

The following lodges have remitted $1.50 each: 6, 7, 9, 13, 14, 15, 16, 19, 20, 22, 23, 29, 35, 37, 42, 44, 47, 49, 54, 57, 59, 60, 67, 72, 73, 75, 78, 83, 84, 89, 92, 93, 96, 97, 99, 101, 102, 113, 120, 123, 124, 126, 128, 129, 135, 136, 138, 139, 143, 145, 150, 151, 152, 155, 158, 160, 164, 166, 167, 175, 180, 194, 196, 202, 203, 212, 214, 215, 217, 218, 219, 220, 223, 226, 228, 231, 236, 240, 242, 245, 260, 270, 273, 274, 277, 282, 287, 295, 296, 297, 305, 307, 308, 311, 323, 327, 330, 334, 338, 352, 353, 361, 369, 370, 372, 377, 381, 398,

400, 406, 407, 408, 410, 415,
417, 419, 426, 432, 437, 447,
449, 456, 458, 472, 482, 484,
485, 491, 492, 496, 500, 504,
507, 508, 514, 521, 522, 533,
540, 543, 545, 548, 556, 558,
559, 563, 565, 566, 570, 571,
573, 574, 575, 591, 595, 602,
603, 605, 611, 612, 622, 624,
627, 629, 636, 637, 641, 652,
661, 665, 670, 671, 676, 679,
686, 691, 709, 712, 713, 716,
721, 723, 735, 738, 749, 755. .$279 00

Lodge 87	$2 00
Lodge 168	5 00
Lodge 284	5 00
Lodge 401	6 00
Lodge 477	3 00
Lodge 532	1 00
Lodge 662	3 45
W. S. C.	1 50
A. Dillon	1 50
P. A. Lynch	1 50
J. J. Leahy	50
Total	$309 45

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Forum

Sick and Accident Insurance.

As an humble member of our Brotherhood and one who is eager to see it grow in numbers and accomplish everything possible for its members, I desire to say a few words in regard to the sick and accident insurance proposition submitted by Lodge 100. The question of accident insurance was referred to the Board of Directors by the Columbus Convention, with instructions to formulate a plan to carry it into effect, and to submit it to the membership to be ratified by a referendum vote. I feel that we are all interested enough in our families and those other than our families who are dependent on us, to carry accident insurance; yet if only one plan is submitted it might be vetoed by the members as not desirable, and that would kill any effort made in the future to establish accident insurance.

To illustrate: I would vote against a plan of accident insurance that would pay a death benefit, as I think that we have enough death benefit now. I would vote for a weekly indemnity not to exceed three-fourths the wage a brother would make, but I would prefer to have a sick and accident indemnity for several reasons, one of which I will mention.

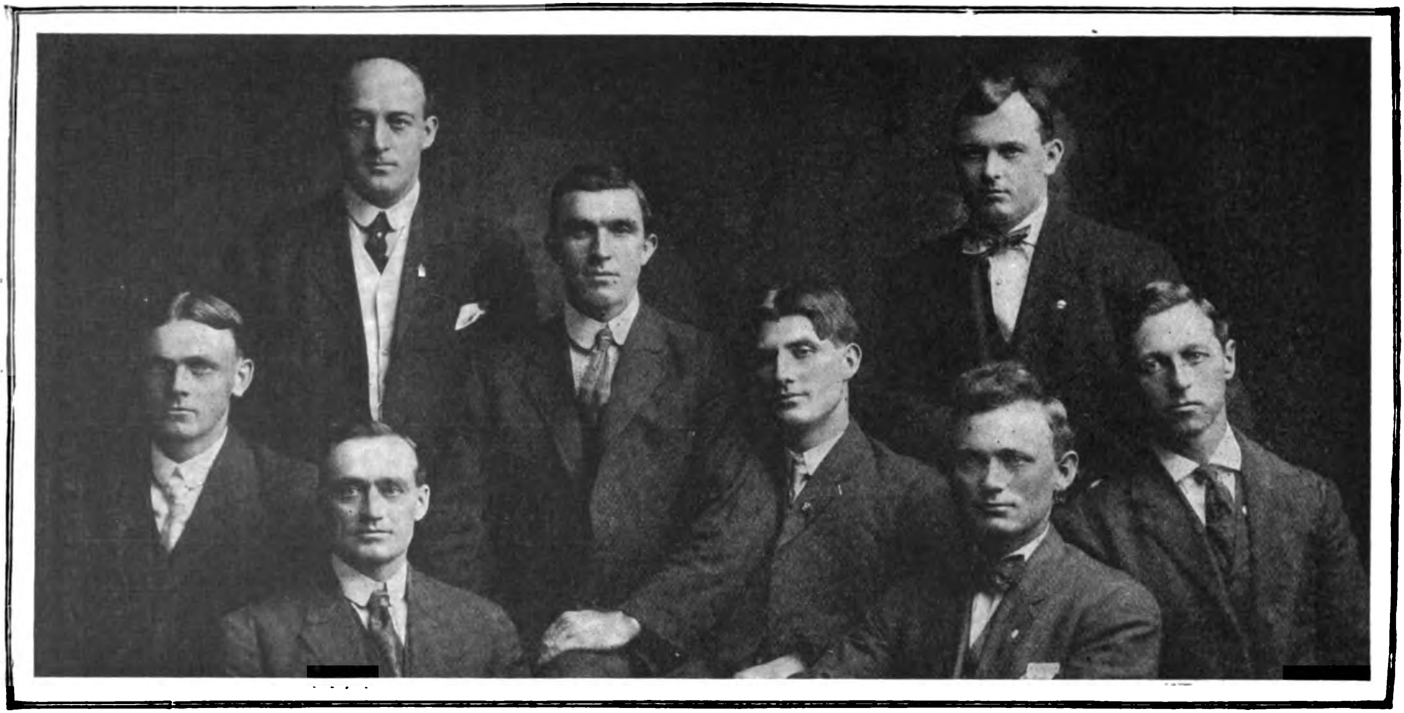
Few of us, if any, are very well fixed financially, and quite a number of us depend on our monthly check to pay grocery bills, fuel bills and to buy clothing and meet the cost of other necessities for our wives, children and ourselves, and in the case of some few to meet our monthly note on that modest little place we call home and that we love so well.

When a man is at work and in good health this can all be done, but let him meet with an accident or get sick, then see how quickly the little store of cash runs out, and how hard it is for him to get on his feet again. But suppose a man should get $10.00 a week while injured or sick. He might not be able to meet all obligations, but he would certainly be above actual want and independent of such charitable expedients as the raising of a sum for his benefit by passing a paper around among the boys on pay day.

I think that in times of sunshine it is well to prepare for rain; likewise in periods of health to make provision to take care of oneself in case of sickness or accident, and I feel that we can do that best and with most mutual advantage by making sick and accident insurance a feature of our Brotherhood.

In unity there is strength. The past has demonstrated this fact to all of us, so I think we should continue the good work of the past by doing more for ourselves in the future.

Stop keeping up concerns which operate only to make money out of us and others like us, and let us do these things



Sidney Vannamee

S. A. Warner
Chairman

T. M. Brookmeyer

Chas. Youngreen
Vice Chairman

Rowland Foster

Neil Wilder

H. Humphrey
Sec.-Treas.

H. J. McKenra

JOINT PROTECTIVE BOARD, PERE MARQUETTE RAILROAD for ourselves, thus deriving all the advantages they offer at actual cost, which we will find to be very materially below their charges when we stop to consider their operating expenses and the large per cent. of profit made by them.

Think this matter over, brothers, and when the Board of Directors send out their plans, vote for the one that you think best, and let us have a SICK and ACCIDENT INSURANCE, one or the other, or both. Always bear in mind that no member shall be compelled to carry this insurance—that it is to be optional with him.

B. I. W.

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Correspondence

LODGE 399—(*T. J. Joyce, New Orleans, La.*) Old Crescent City Lodge is still alive and doing fine business, notwithstanding the financial difficulties which have befallen it during the past few years. We are glad to say that through the hard working efforts of our officers and members we have effected a standing financially and otherwise that has not been surpassed for many a day. We have a good set of officers. Our Collector reminds the boys occasionally that it is time to pay up, but they are all thankful for the reminder and pay up like men. We have a number of members who are on the right-hand side. We have an average of two candidates at each meeting and a large number of men who are eligible to become members as soon as business picks up. Our officials deal fairly and squarely with us, especially our master mechanic and general foreman, who are very courteous and kind to us at all times, granting our boys everything within reason.

On November 9th last we had our General Chairman, Bro. J. I. Parel, with us, adjusting a few grievances, all of which were handled satisfactorily to all concerned. All the boys here think that no one can do any better than "Jim" Parel, and when he gets on the train to go home they are satisfied that the best has been done that could be done. He is highly thought of and that is saying a good deal for a general chairman on such a large system as ours.

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LODGE 718—(*D. Stewart Balls, Ashland, Ky.*) Our lodge is run on the best plan of any lodge I have ever attended, having visited several neighboring lodges, and I think that if they would visit us in return they would be greatly pleased. Once in a while the boys will not show up on meeting day and the faithful president and secretary will wait in vain. The reason for this can easily be explained. One brother will say, "Well, I have been attending lodge pretty well of late; I just won't go today. All the rest will be there and they won't need me, anyhow." The "rest" are thinking the same thing about the same time and consequently nobody comes. We are hoping, however, that all of our brothers will attend lodge meetings reglularly hereafter. Remember:

That the brother who is satisfied
  That the lodge shall run itself,
Will find things badly out of joint
  When the goat's upon the shelf.

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LODGE 414—(*K. E. Light, St. Louis, Mo.*) We are all enthusiastic and turning out business according to the constitution, as we have an able staff of officers. All of them keep their time cards and street clothes on the right-hand side of the seat box, but none of them have forgotten how to use the emblem of hard labor, the principal working tool of our profession. They keep in touch by frequently showing us how they did in the bygone yesterdays of other seasons.

We went through the panic without cutting our board, but it took some very close financiering; comparatively speaking, it was like trying to keep an old steamer heated with a tank of slack and a wornout scoop. Business has revived to some extent and the boys are all doing their share once again. It was about time, for we were almost out of overalls and gloves.

A deplorable and unusual accident occurred on our lines on September 26th last, at Carthage, Mo., which caused the death of Bro. Harry E. Jaharaus, and his engineer. A passenger train going at a high rate of speed was derailed on a curve, the engine rolling down an embankment. Engineer Louis Blasco and Bro. Jaharaus, in jumping, were caught on the embankment by the engine, which rolled over on them, crushing them to death. Members of Lodge 440, Monett, Mo., brought Bro. Jaharaus's remains to his home at Pacific, Mo. The funeral services were in charge of our lodge. Brothers from Nos. 440 and 569 were present and followed the remains to the cemetery. There were many beautiful floral tributes.

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LODGE 751—(*H. C. Diehl, Murdo, S. D.*) We were organized on August 10th last, with 18 charter members, and have taken in seven since. We are making 751 a "hummer" and believe that in four months it cannot be beat for a new lodge. We know of lodges of several years' standing that have not done any better than we have in four short months; so look out for us; we will be heard from again.

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LODGE 538—(*H. C. Wickliffe, South Chicago, Ill.*) Having read nearly every Magazine through from cover to cover for the past eight years, I have decided to contribute something from old 538, and as we have the best Magazine in the world, I think it no more than right for every brother to keep a pencil handy and send good correspondence in for its columns, so as to help our Editor and Manager keep it on top, as he has done in the past, and as he will continue to do in the future.

Our lodge has not been as successful this past year as it should have been. We have had quite as much work as any lodge in the State, but matters have not been handled just as they should have been, the evil of "one man rule" unfortunately prevailing. At our last election, however, we selected as capable a set of officers to guide the destinies of our lodge as could be found anywhere on the continent, and that each will perform the duties of his respective position up to the highest standard of efficiency throughout his entire term of office is the confident expectation of our members, and one in which they will not be disappointed. Our president, Bro. F. M. Walsh, has been giving excellent satisfaction, and our recording secretary and treasurer, Bro. W. A. Pitzle, is recognized as one of the best financiers in the city of Chicago; our financial secretary also being the right man in the right place. We now have a membership of about 105 and I truly believe that we will double that number during the next year, as the new steel city of Gary, Ind., will be in full operation in a few months, necessitating the employment of many additional enginemen. Our lodge has jurisdiction over all of the Chicago, Lakeshore and Eastern Railroad—the only road available to do work for these mills—hence the advantage which will accrue to it from this great industry. We have been having some good, lively meetings of late, some of which have lasted often until 2:00 a. m. We wish every brother in the Order a pleasant holiday season.

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LODGE 262—(*Member, West Toronto, Ont.*) That our brothers may know how 262 is getting along, I would say that we are still prospering and all who are interested in the welfare of our Order will be glad to learn that some members who withdrew, under the impression that they could better themselves by so doing, are again rejoining our ranks, three of them having very recently been readmitted to membership in the "Old Tried and True."

An event which is well worthy of special mention in the annals of Toronto lodges and divisions of the various railway orders was the Railroad Memorial Service held in the High Park Methodist Church of West Toronto on November 8th.

Railroad men and their mothers, wives, sisters and friends, crowded the sacred edifice. Many clergymen assisted in the services. The Rev. Mr. Simpson offered the opening prayer and referred to those in whose memory the services were held as "comrades who in the prime of their splendid manhood have laid down their lives." He pleaded that more kindly remembrances and sympathy be extended to the men who undergo such daily and hourly danger for their fellowmen.

As the list of the names of the departed railroad men were read off, those of Brothers Wm. Quinn and Willis Jarvis of 262 attracted special attention, as the awful wreck in which these brothers lost their lives was of such recent occurrence. It occurred at Mimico on September 25th last. Bro. Quinn was killed outright and Bro. Jarvis, who was firing for him, died from his injuries a few days later. All the brothers who attended the Toronto Union Meeting in August, 1905, will remember Bro. Quinn, as he was one of the committee from 262. His picture appears on page 558 of volume 39 of the Magazine, he being the first one on the right of the second row. He also represented 262 at the Milwaukee (1906) Convention. He was one of the most popular members of 262.

The Rev. Dr. Hazlewood, during the course of his remarks, referred to a certain piece of track between Toronto and a nearby city where a cemetery and a gloomy swamp on either side of the track make a dreary road, which ends at last in the darkness of a tunnel, but as the train emerges from the tunnel the brightness and beauty of the terminal city flashes upon the view.

"That bit of road," said Dr. Hazlewood, "always reminds me of life and of that which lies beyond." In concluding the Rev. Doctor admonished his hearers that if we could hear the counsel of the men who have gone they would say, "Do your work well." After "Forever With the Lord," had been sung by the congregation, the services concluded with benediction by Dr. Pigeon, a Presbyterian minister of West Toronto.

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LODGE 13—(*Member, Jersey City, N. J.*) A coincidence which I consider worthy of special notice occurred recently. Our first meeting in November was held on Friday the thirteenth. There were thirteen brothers present and as the number of our lodge is 13, and the meeting was held over an undertaking establishment, it is needless to say that our members are not superstitious.

The financial depression has affected us as well as other lodges, but so far we have not had any withdrawals, but to the contrary have had an odd job now and then for the goat. Our meetings are interesting, and if those brothers who stay away on meeting nights would come and spend an hour in the lodge room they would hear much that would interest them and receive some valuable information, as our lodge is again taking her place as one of the banner lodges of the East. We have noticed with great pleasure the change in the title of "master" wherever it appears in our organization, and we heartily approve of the term "president," as it is more congenial to American ideals and more representative of a liberty-loving people.

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LODGE 756—(*John G. Hird, New Toronto, Ont.*) I have been an interested reader of the Magazine for the past five years and a member of our Brotherhood for nearly three years. I have not yet seen anything in our Magazine regarding our new lodge, which I think was the youngest at the time of our recent Columbus Convention. At our opening we had a goodly number of brothers from our sister lodges, Nos. 67 and 596, together with Second International Vice-President, Bro. E. A. Ball, who gave us a magnificent sendoff.

We have kept the ball rolling and much credit is due our worthy president, Bro. T. Huesten, and his efficient staff of officers, as well as our members, for the excellent meetings we are having. We have changed our first meeting in the month from the afternoon of the first Thursday to the evening of the first Thursday at 7:30, and we also meet the third Thursday evening at 7:30.

We were greatly pleased to see our delegate return from the recent Convention looking so well, enthusiastic and full of energy to advance the interests of our great Brotherhood, than which there is no better organization in the world today.

All the boys take great interest in the Magazine. Work was slack all summer, but business is on the move again, and we hope in a short while to have the remainder of the firemen running out of Mimico station welcomed amongst the "Tried and True."

Before long five or six of our brothers will take their stand for the right side, in which we wish them every success.

We are called away from home a week at a time, which makes it impossible to attend every lodge meeting.

We have a fair class of engines and all pretty good steamers. We also have the nicest lot of firemen in the service of the Grand Trunk. Our engineers are a nice, manly lot of men, who will give a fireman a kind handshake any time and any place, and will be considerate with him when the steam pointer leans to the left with the "real estate" we sometimes get. We also have an excellent set of officials to deal with—men who see that we are well supplied with tools with which to do our work. The Y. M. C. A. secretary here studies the requirements of the railroad man and we have good, clean beds and well ordered meals. We are steadily climbing the ladder of success and are getting new members right along. I feel the day is not far distant when our noble Order will stand before the world as a great Gibraltar. Be true to your cause and do right, and in the end you can say, "I have fought a good fight."

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J. H. Bridges, 405 G. E. Harry, 49 F. J. Schleuter, 481 C. T. Anderson, 408
Chas. F. Thomas, 535 Chairman Timothy Shea, 2d V. G. M. S. Sparkman, 54 Vice Chmn. J. M. Riopelle, 532 Sec.-Treas.
W. C. Reese, 556 J. G. Kinslow, 526

JOINT PROTECTIVE BOARD, WABASH SYSTEM WEST OF DETROIT

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Official

Addresses Wanted.

Persons requiring the address of or any information concerning another will please communicate with the secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the secretary of such lodge, requesting that a notice be published in the Magazine inquiring for such address or other information, same will be complied with. However, the Magazine can not undertake the office of a collecting agency, and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the person specified in the notice:

Otto Stedman.—Left his home in Decatur, Ill., on May 28, 1906. Is six feet two inches tall, weighs 180 pounds; is stoop-shouldered, has light complexion and gray eyes; has small scar on left side of nose and a small scar on upper lip; shaves smooth and is about thirty years of age. Anyone knowing his whereabouts will confer a favor on his sick mother by corresponding with C. M. Shook, 1497 N. Clinton street, Decatur, Ill.

Wesley P. McDonald.—About 25 years of age and six feet tall, weighs 160 pounds, has dark brown hair and eyes inclined to gray. Was a member of the Brotherhood at one time. Was firing on the Northern Pacific fall and winter of 1904 and 1905. When last heard from was working at Dallas, Oregon, for a railroad construction company. Anyone knowing his whereabouts will confer a favor on his parents by addressing J. W. McDonald, Box 757, Anaconda, Mont.

Nathan Anderson.—Is somewhere between 22 and 25 years of age, has sandy hair, is of medium height, has blue eyes, smooth face, and weighs about 140 pounds. Was at one time a fireman on the Lehigh Valley Railroad out of Buffalo, N. Y. Any information concerning his present whereabouts will be appreciated by Fred H. Dunham, Attorney at Law, Batavia, N. Y.

Charles S. Wann.—Four years ago was firing out of Little Rock, Ark. Has also fired on the C. & E. I. R. R. Anyone in possession of any information regarding him will please correspond with Chas. A. Weber, 125 Ninety-first street, South Chicago, Ill.

J. J. Finncan.—Has not been heard from for two years. At that time he was firing out of McKee's Rocks, Penna. His relatives are very anxious to locate him on account of sickness and death in the family. Anyone knowing his whereabouts or in possession of any information regarding him will please correspond with Mrs. Julia Finncan, 32 South street, Washington, Penna.

◆ ◆ ◆

Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Pocketbook containing card No. 46,402, good until December 31, 1908, with description as follows: "Medium brown hair, blue eyes, belonging to W. R. Crawley, member of Lodge 502, B. of L. F. and E.," was either lost or stolen recently. If presented take up, or if found return to Orris Reynolds, Secretary Lodge 502, 107 Waverly Court, Louisville, Ky.

Receipts for quarters ending September and December, 1908; also black leather card case belonging to Wilmer Hill, member of Lodge 237, B. of L. F. and E., were either lost or stolen at Watertown, S. D. If found please return to Harry Lynch, Secretary of Lodge 237, B. of L. F. and E., 1988 Washington Blvd., Chicago, Ill.

Card case containing receipts from December, 1907, to October, 1908, also traveling card for quarter ending June 30, 1908, and an order for the secret work for quarter ending June 30, 1908, belonging to M. B. Rogers, member of Lodge 340, B. of L. F. and E., was recently stolen from him at 720 Main street, Great Bend, Kans. It is thought they were stolen by another man in train service who was stopping at the same place.

If any of these cards are presented please take up and notify M. B. Rogers, 720 Main street, Great Bend, Kans.

* * *

Acknowledgments.

Mrs. Mary E. Asdel, Chanute, Kans., wishes to thank the Brotherhood for the kindness shown her during her sad bereavement by the death of her husband, Bro. Harry E. Asdel, of Lodge 153; also for the prompt payment of his claim. She wishes to especially thank the members of Lodges 153 and 154 for the beautiful floral offerings which they sent.

Mrs. Louis W. Feinstein, of Atlanta, Ga., wishes to thank the Brotherhood for the prompt payment of claim of her husband, Bro. Louis W. Feinstein, of Lodge 247. She also wishes to thank the members of Lodge 247 for the kindness shown herself and husband during his illness.

Mrs. B. C. McGuire and Mr. and Mrs. A. W. McGuire, of Fresno, Cal., wish to express their heartfelt thanks to all members of Yosemite Lodge 566 who tendered them their sympathy and assistance in the hour of their sad bereavement. All acts of kindness will forever be remembered by them.

* * *

The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of November, 1908:

B. of L. F. and E. Lodges 49, $10; 52, $5; 53, $5; 54, $5; 105, $15; 110, $5; 149, $5; 155, $5; 165, $5; 180, $12; 199, $5; 204, $10; 211, $5; 217, $15; 220, $5; 252, $5; 352, $2; 361, $4.75; 381, $5; 399, $1; 406, $5; 419, $10; 449, $5; 485, $12; 533, $1; 578, $10; 611, $5; 633, $5; 671, $5	$187 75
L. S. to B. of L. F. and E. Lodges 5, $5; 18, $10; 43, $5; 83, $2; 90, $2; 105, $5; 112, $7; 135, $1; 139, $2; 147, $2; 150, $5; 160, $5; 171, $2; 208, $5; 225, $5; 234, $5; 239, $2	70 00
O. R. C. Divisions	408 76
B. of R. T. Lodges	941 00
B. of L. E. Divisions	404 00
L. A. C. Divisions	219 09
L. A. T. Lodges	129 00
G. I. A. Divisions	225 00
Receipts from individuals amounting to $1.00 and under	20 35
Rev. C. P. Goodson, Highland Park, Ill	3 00
H. T. Dunn, Lodge 149, B. of L. F. and E	5 00
Chas. J. Thompson, Division 2, O. R. C	5 00
Sewing Club, Division 84, G. I. A	5 00
Webb C. Ball, on account of joint excursion given August 16th	10 00
Interest on deposit, Cleveland, Ohio	187 26
Interest on deposit, Clinton, Iowa	120 80
Proceeds charity bazaar, Division 213, L. A. T	23 25
Proceeds of Murray Stock Co., Lodge 251, B. of R. T	23 10
Proceeds of social given by Division 48, L. A. C., Chattanooga, Tenn	21 00
Total	$3,008 36

Miscellaneous.—One quilt from Mrs. J. Daniels, Division 60, G. I. A.; one quilt from Division 230, L. A. T.; one quilt from Sewing Club, Division 174, G. I. A.; barrel of canned goods and tobacco from Division 235, L. A. T.; barrel of canned fruit from Division 224, L. A. T.; barrel of canned fruit from Division 69, G. I. A.

Respectfully submitted,
JOHN O'KEEFE,
Sec. and Treas., R. R. M. H.

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER.
PEORIA, ILL., December 1, 1908.

TO SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of November 1908:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	457 50	77	395 25	153	311 00	229	503 75	305	129 25	381	333 25	457	170 50	533	84 75	609	57 75	685	135 25
2	34 00	78	159 75	154	124 75	230	482 50	306	232 25	382	172 50	458	68 25	534	280 50	610	54 75	686	28 00
3	892 50	79	70 50	155	86 25	231	591 00	307	209 00	383	225 25	459	78 75	535	182 50	611	81 00	687	80 75
4	322 25	80	......	156	254 25	232	208 50	308	79 50	384	216 75	460	......	536	137 25	612	110 00	688	85 75
5	316 75	81	116 50	157	......	233	224 25	309	330 75	385	68 25	461	143 25	537	110 25	613	26 25	689	108 50
6	346 50	82	204 00	158	125 25	234	162 75	310	295 25	386	66 00	462	206 00	538	200 00	614	283 50	690	66 50
7	248 00	83	360 25	159	214 25	235	229 25	311	96 00	387	......	463	391 50	539	303 75	615	114 25	691	38 25
8	461 50	84	132 75	160	194 25	236	446 25	312	185 25	388	209 25	464	180 00	540	299 00	616	68 25	692	38 00
9	366 50	85	328 75	161	59 25	237	409 00	313	144 00	389	101 75	465	230 50	541	155 75	617	141 75	693	......
10	998 50	86	202 00	162	482 50	238	229 25	314	205 00	390	164 75	466	170 75	542	207 00	618	190 50	694	101 25
11	256 50	87	165 25	163	178 75	239	79 00	315	189 75	391	178 25	467	142 75	543	280 50	619	97 50	695	92 75
12	234 00	88	140 00	164	88 00	240	416 75	316	229 75	392	175 00	468	31 50	544	......	620	103 00	696	55 25
13	289 75	89	63 00	165	68 50	241	305 50	317	106 25	393	170 50	469	129 00	545	91 25	621	62 50	697	69 75
14	459 50	90	84 00	166	227 00	242	313 50	318	333 00	394	24 00	470	236 25	546	51 75	622	199 75	698	158 25
15	158 25	91	851 00	167	......	243	114 75	319	157 50	395	105 75	471	35 25	547	111 75	623	131 25	699	97 00
16	525 00	92	189 75	168	255 75	244	173 00	320	54 75	396	199 75	472	350 50	548	85 25	624	74 25	700	......
17	193 75	93	133 50	169	406 50	245	......	321	135 00	397	67 75	473	35 50	549	132 75	625	96 75	701	181 25
18	168 00	94	439 25	170	499 00	246	299 50	322	95 75	398	158 00	474	......	550	70 00	626	......	702	166 75
19	318 00	95	67 75	171	118 50	247	497 75	323	54 75	399	111 00	475	143 75	551	239 00	627	84 75	703	56 25
20	51 00	96	210 00	172	99 75	248	288 50	324	168 75	400	149 50	476	82 00	552	210 75	628	134 00	704	194 00
21	370 75	97	440 00	173	282 25	249	150 50	325	101 75	401	286 75	477	373 25	553	294 75	629	23 50	705	169 50
22	90 75	98	277 75	174	665 00	250	233 50	326	203 00	402	100 75	478	......	554	112 50	630	137 50	706	39 00
23	138 50	99	591 00	175	342 00	251	326 25	327	264 50	403	61 50	479	112 75	555	107 25	631	108 25	707	72 75
24	359 25	100	172 50	176	167 50	252	314 25	328	326 50	404	128 50	480	46 50	556	78 75	632	68 25	708	......
25	304 50	101	735 00	177	189 50	253	300 75	329	67 50	405	228 00	481	145 25	557	246 00	633	143 25	709	82 25
26	231 75	102	170 50	178	212 25	254	107 50	330	272 75	406	80 25	482	169 75	558	196 75	634	226 00	710	106 50
27	254 50	103	61 50	179	154 00	255	......	331	164 25	407	281 25	483	76 00	559	136 25	635	165 25	711	76 50
28	179 50	104	131 25	180	82 25	256	......	332	91 00	408	208 00	484	162 75	560	63 00	636	61 75	712	28 50
29	140 25	105	103 00	181	70 75	257	102 25	333	273 25	409	250 75	485	944 25	561	230 25	637	84 50	713	87 00
30	184 00	106	93 25	182	......	258	......	334	258 75	410	174 00	486	82 75	562	351 75	638	......	714	11 25
31	145 50	107	264 25	183	253 00	259	185 00	335	53 25	411	201 00	487	24 75	563	247 50	639	65 50	715	45 75
32	172 00	108	189 00	184	80 25	260	294 25	336	108 00	412	213 25	488	75 00	564	238 50	640	......	716	66 00
33	161 50	109	201 50	185	93 75	261	90 75	337	359 75	413	47 25	489	......	565	58 00	641	101 25	717	25 50
34	210 25	110	159 00	186	32 25	262	305 25	338	150 75	414	299 25	490	286 25	566	183 25	642	73 50	718	45 00
35	107 50	111	226 50	187	102 50	263	196 75	339	108 75	415	154 50	491	59 25	567	142 75	643	......	719	157 50
36	126 75	112	53 00	188	433 50	264	108 00	340	143 50	416	184 25	492	290 25	568	183 00	644	112 75	720	24 75
37	184 00	113	140 75	189	267 25	265	360 00	341	233 75	417	97 50	493	60 75	569	216 00	645	70 75	721	39 00
38	111 75	114	58 50	190	68 25	266	259 00	342	239 75	418	203 25	494	113 00	570	100 75	646	281 50	722	66 75
39	133 50	115	128 00	191	441 25	267	103 50	343	70 50	419	134 00	495	......	571	220 50	647	190 00	723	37 00
40	364 50	116	......	192	362 50	268	46 50	344	161 25	420	96 00	496	160 75	572	95 50	648	51 25	724	......
41	......	117	117 75	193	125 25	269	......	345	240 75	421	87 00	497	110 25	573	256 25	649	45 00	725	57 25
42	......	118	46 50	194	432 25	270	328 75	346	31 50	422	80 50	498	128 25	574	138 00	650	54 00	726	49 50
43	177 75	119	134 25	195	104 50	271	149 00	347	96 00	423	46 75	499	41 25	575	94 50	651	129 00	727	47 25
44	285 00	120	209 75	196	130 00	272	58 50	348	200 00	424	155 25	500	125 75	576	77 25	652	192 75	728	......
45	539 75	121	288 00	197	100 50	273	240 00	349	351 75	425	111 00	501	231 25	577	78 00	653	106 50	729	39 00
46	35 25	122	......	198	381 50	274	130 75	350	97 25	426	276 25	502	230 50	578	285 50	654	129 50	730	56 50
47	301 00	123	289 50	199	173 75	275	342 00	351	40 75	427	82 75	503	175 00	579	52 50	655	67 00	731	120 00
48	363 75	124	175 50	200	78 00	276	275 25	352	112 00	428	77 50	504	72 00	580	......	656	159 00	732	40 50
49	186 00	125	51 00	201	173 75	277	148 50	353	169 25	429	147 25	505	58 50	581	71 50	657	156 50	733	54 25
50	166 50	126	169 75	202	204 75	278	27 00	354	247 50	430	108 00	506	121 50	582	87 75	658	91 00	734	91 50
51	181 00	127	276 25	203	287 75	279	98 00	355	225 00	431	69 75	507	178 50	583	123 75	659	161 25	735	84 75
52	335 00	128	154 75	204	280 50	280	150 00	356	184 00	432	229 00	508	358 50	584	32 25	660	90 75	736	44 50
53	147 00	129	294 75	205	107 25	281	208 25	357	74 25	433	141 50	509	75 00	585	93 25	661	85 75	737	19 50
54	430 00	130	500 50	206	74 25	282	39 75	358	162 25	434	204 00	510	163 25	586	85 50	662	61 75	738	24 00
55	60 25	131	46 75	207	311 50	283	106 50	359	134 50	435	148 00	511	403 25	587	......	663	186 00	739	70 50
56	246 50	132	117 25	208	......	284	643 00	360	114 75	436	250 50	512	162 00	588	73 50	664	......	740	75 00
57	528 25	133	......	209	......	285	......	361	120 00	437	37 50	513	96 75	589	66 00	665	72 25	741	48 25
58	228 25	134	63 75	210	93 25	286	204 50	362	85 50	438	161 25	514	133 25	590	......	666	......	742	38 25
59	477 75	135	197 25	211	261 25	287	1242 25	363	......	439	89 25	515	187 50	591	201 00	667	91 75	743	64 00
60	336 75	136	57 75	212	224 75	288	102 75	364	167 00	440	211 75	516	150 75	592	127 75	668	119 25	744	......
61	127 50	137	115 75	213	176 25	289	132 50	365	40 50	441	202 25	517	......	593	79 75	669	69 00	745	38 00
62	98 25	138	310 75	214	557 00	290	199 25	366	......	442	124 00	518	36 00	594	178 00	670	262 75	746	68 25
63	250 25	139	354 50	215	382 50	291	78 00	367	207 75	443	221 50	519	277 25	595	53 25	671	100 50	747	61 50
64	237 25	140	345 25	216	126 75	292	39 75	368	107 00	444	503 50	520	40 50	596	117 00	672	105 75	748	60 00
65	212 25	141	641 00	217	202 25	293	158 50	369	198 25	445	......	521	174 25	597	183 25	673	785 75	749	87 25
66	148 50	142	225 75	218	239 25	294	......	370	68 00	446	198 25	522	261 00	598	92 50	674	46 50	750	44 75
67	112 50	143	......	219	265 75	295	326 75	371	174 00	447	147 25	523	151 50	599	123 75	675	......	751	44 00
68	119 50	144	85 50	220	599 00	296	370 50	372	173 75	448	688 00	524	49 00	600	195 25	676	61 75	752	52 25
69	80 25	145	215 75	221	139 50	297	276 00	373	180 75	449	311 50	525	167 50	601	265 50	677	136 25	753	48 75
70	209 00	146	260 50	222	132 00	298	346 50	374	169 00	450	305 25	526	47 25	602	......	678	......	754	......
71	349 25	147	234 50	223	232 50	299	139 00	375	99 00	451	158 50	527	132 00	603	134 75	679	99 00	755	55 50
72	336 00	148	284 75	224	93 75	300	249 00	376	39 00	452	167 50	528	217 50	604	159 00	680	83 25	756	28 50
73	260 50	149	444 00	225	124 50	301	144 00	377	209 25	453	56 25	529	202 25	605	157 75	681	132 25	757	......
74	191 25	150	330 00	226	276 75	302	403 00	378	562 25	454	172 25	530	127 25	606	31 50	682	86 00	758	33 00
75	480 75	151	129 00	227	......	303	111 00	379	376 75	455	146 50	531	110 50	607	......	683	180 50	759	......
76	21 00	152	321 50	228	425 25	304	216 00	380	104 25	456	75	532	128 50	608	183 25	684	133 00	760	121 75

Received during month of November.. $128,304.25

Respectfully submitted, W. S. CARTER, G. S. and T.

Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM OCTOBER 31, 1908, TO NOVEMBER 30, 1908.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.		Am't. of Ins.	Cause.
1342	Neal Barnes	247	Death	Aug. 17,	1908	$1,500	Run over by engine.
1241	Joseph A. Hanson	6	Disability	Oct. 21,	"	1,500	Consumption of lungs.
1370	Frank H. Bolter	542	Death	Aug. 23,	"	1,500	Derailing of engine.
1372	Willie N. Pickens	217	"	Sept. 12,	"	500	Consumption of lungs.
1373	Elza Smith	683	"	" 5,	"	500	Derailing of engine.
1375	Martin Larsen	88	"	" 6,	"	1,500	Heart disease.
1382	W. H. Zimmerman	412	Disability	" 19,	"	2,000	Bright's disease.
1385	Duck Sullivan	652	Death	Aug. 25,	"	1,000	Typhoid fever.
1386	Ferdinand Newshutz	630	"	Sept. 21,	"	1,000	Falling under engine.
1387	Joseph Pultz	36	"	" 21,	"	1,500	Boiler explosion.
1389	Joseph F. Boyle	646	"	" 26,	"	1,000	Run over by street car.
1392	Alvin L. Thomas	466	"	" 24,	"	1,500	Gunshot wound.
1395	Wm. G. Meredith	6	"	Oct. 2,	"	1,500	Derailing of engine.
1396	Ralph Titus	680	"	Sept. 22,	"	1,500	Struck by engine.
1397	Lemuel C. Curtis	522	"	" 22,	"	1,500	Crushed by falling log.
1398	Wm. A. Quinn	262	"	Oct. 1,	"	1,500	Collision.
1399	William Downs	11	"	Sept. 29,	"	1,500	Bursting of flue.
1400	Fred Hudson	45	Disability	Oct. 27,	"	1,500	Locomotor ataxia.
1402	Otto H. Borth	101	Death	" 1,	"	1,500	Struck by engine.
1404	Arthur P. Darcy	657	"	" 4,	"	1,000	Struck by coal bucket.
1405	Walter F. Ramsey	273	"	" 5,	"	1,500	Typhoid fever.
1406	Jesse E. Tatum	402	Disability	Sept. 17,	"	1,000	Amputation of foot.
1410	Harry E. Jahraus	414	Death	" 24,	"	1,500	Derailing of engine.
979	John G. Gustafson	128	"	April 14,	"	97	Derailng of engine.
1328	Jerry E. Gallagher	26	"	Aug. 27,	"	1,500	Collision.
860	Robert Oliver	252	Disability	May 9,	"	1,500	Bright's disease.
1165	Horace H. Welsh	191	Death	June 6,	"	1,500	Drowned.
1285	Wilber A. Todd	405	"	July 19,	"	500	Heart disease.
1384	John H. Coleman	250	"	Sept. 20,	"	1,500	Appendicitis.
1378	Thos. F. Picklesimer	718	Disability	Nov. 7,	"	1,500	Paralysis.
1139	Ernest G. Lee	625	"	" 3,	"	1,000	Consumption of lungs.
1337	Frank B. McNamara	260	"	" 7,	"	1,500	Paralysis.
1358	Charles Moore	76	Death	Aug. 28,	"	500	Diabetes.
1374	Louis W. Feinstein	247	Disability	Nov. 1,	"	1,500	Consumption of lungs.
1401	Peter J. Johnson	170	"	July 31,	"	500	Amputation of foot.
1408	Lee W. Mitchell	522	Death	Sept. 30,	"	500	Run over by cars.
1409	Ora L. Babcock	191	"	" 25,	"	2,000	Head-end collision.

Death Claims Paid.

16—A	$24,000.00
4—B	4,000.00
5—C	2,500.00
1—D	2,000.00
Deduction	97.00
26	$32,597.00

Disability Claims Paid.

6—A	$9,000
2—B	2,000
1—C	500
1—D	2,000
10	$13,500

36 death and disability claims paid, aggregating $46,097.00

Note—Claim 979—Deduction for funeral expense only, paid on this claim.

Pending Claims November 30, 1908.

61 death claims aggregating	$82,000
20 disability claims aggregating	26,500
Total of 81 claims aggregating	$108,500

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Statement of Death and Disability Claims

FILED WITH THE GRAND SECRETARY AND TREASURER DURING THE MONTH ENDING DECEMBER 15, 1908.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
1455	Chas. Deardorff	49	Nov. 16, 1908	Disability	Impaired vision, hearing and rupture	$1,500
1456	Jos. W. Davidson	247	“ 16, “	Death	Run over by engine	1,500
1457	Chas. M. Humphrey	476	“ 16, “	“	Head-on collision	1,500
1458	Joseph J. Murphy	105	“ 16, “	Disability	Bright's disease	1,500
1459	Edward T. Trout	287	“ 16, “	Death	Typhoid fever	1,500
1460	F. F. Hirsch	396	“ 16, “	Disability	Consumption of lungs	1,000
1461	French J. Jones	625	“ 17, “	Death	Head-on collision	1,500
1462	John F. Lann	45	“ 17, “	“	Abscess of liver	1,500
1463	B. F. Wagner	27	“ 17, “	Disability	Impaired vision and deafness	1,500
1464	Carl F. Schuster	296	“ 18, “	Death	Run over by cars	1,500
1465	Roscoe Cravens (a)	204	“ 19, “	“	Dysentery	1,500
1466	Frank I. Brown	93	“ 19, “	Disability	Injury to neck	1,000
1467	Peter Deitz	363	“ 20, “	Death	Typhoid fever	1,500
1468	James B. Taylor	63	“ 20, “	Disability	Amputation of foot	1,500
1469	Norris B. Butler	571	“ 23, “	Death		500
1470	Samuel W. Montz	409	“ 24, “	Disability	Locomotor ataxia	1,500
1471	Frank G. Thompson	510	“ 25, “	“	Amputation of foot	1,500
1472	June Blewett	238	“ 25, “	Death	Malarial fever	1,000
1473	Robert Roe	66	“ 27, “	“	Collision	1,500
1474	Peter C. Kratzenberg	465	“ 27, “	Disability	Locomotor ataxia	1,000
1475	Geo. V. Bothwell	733	“ 28, “	Death	Derailment of engine	500
1476	William Pearse	429	“ 30, “	“	Pulmonary tuberculosis	1,500
1477	Royden R. Miller	594	“ 30, “	Disability	Amputation of foot	1,000
1478	Joseph P. Hampton (b)	185	Dec. 2, “	Death	Consumption of lungs	1,500
1479	David A. Trevors	233	“ 4, “	“	Pneumonia	1,000
1480	Guy G. Allen	344	“ 4, “	“	Tuberculosis of bowels	1,500
1481	Cyrus W. Short	13	“ 4, “	Disability	Bright's disease	1,500
1482	John C. Schley	86	“ 7, “	Death	Collision	1,500
1483	Wm. T. Tucker	241	“ 7, “	“	Boiler explosion	1,500
1484	James D. Sweet	172	“ 7, “	“	Collision	500
1485	Geo. G. Snoke	599	“ 7, “	“	Head-on collision	1,000
1486	John W. Bartholoma	599	“ 7, “	“	Head-on collision	500
1487	Ralph C. Keeler	635	“ 7, “	“	Caught in belt	1,500
1488	Peter H. Righter	656	“ 7, “	“	Derailing of engine	1,500
1489	James A. O'Connor	202	“ 8, “	Disability	Loss of one eye and rupture	1,500
1490	S. Merville Miller	326	“ 9, “	Death		1,500
1491	Patrick McGough	316	“ 9, “	“	Hardening of liver	1,500
1492	Walter E. Trask	4	“ 9, “	“	Heart failure	1,500
1493	Ernest D. Cox	4	“ 9, “	“	Gunshot wound	500
1494	Elmer M. Willard	51	“ 10, “	“	Paralysis	1,500
1495	Joseph Patterson	253	“ 10, “	“	Cirrhosis of liver	1,500
1496	Elmer T. Bradshaw	250	“ 10, “	“	Boiler explosion	1,500
1497	Thomas B. New	574	“ 11, “	Disability	Amputation of foot	1,500
1498	Harry A. Woodring	207	“ 11, “	“	Loss one eye, partial deafness	1,500
1499	Earl V. Case	56	“ 11, “	“	Paralysis of arm	3,000
1500	James L. Daniels	56	“ 11, “	“	Congestion of kidneys	1,500
1501	Drank D. Chapman	64	“ 12, “	Death		3,000
1502	Anthony F. Stuckart	228	“ 12, “	“		1,500
1503	Walter A. Austin	85	“ 14, “	“	Appendicitis	1,500
1504	Louis Dambach	241	“ 14, “	“	Derailment of engine	1,000
1505	Chas. P. Minors	231	“ 14, “	Disability	Blind in one eye	1,500
1506	J. H. Cunningham	83	“ 14, “	“	Rheumatism	1,500
1507	Robert W. Windham	83	“ 14, “	“	Pains in back and legs, etc	1,500
1508	Adolph Hanson	8	“ 14, “	“	Personal injuries	1,000
1509	Clarence H. Williams	364	“ 15, “	Death	Run over by train	1,500
1510	John W. Riley	430	“ 15, “	Disability	Blind in one eye	1,500

Note (a)—Disability Claim No. 1297, filed on account of insanity. Disapproved and referred to Convention. $500 allowed. Member died before any action was taken on donation Claim.

(b)—Disability Claim No. 1425 filed and disapproved on account of death of member.

Respectfully submitted,
W. S. CARTER,
G. S. and T.

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Beneficiary Assessment Notice No. 17.

SERIES H.

GRAND LODGE, B. OF L. F. & E.
PEORIA, ILL., January 1, 1909.

To the Treasurers of Subordinate Lodges:

Sirs and Brothers: You are hereby notified that assessments for death and disability claims are hereby levied as follows: For each beneficiary member whose name appears on the rolls of membership on January 1, 1909 (also for all beneficiary members transferred from your Lodge after January 1), carrying a Beneficiary Certificate of THREE THOUSAND ($3,000) DOLLARS, you are required to forward the sum of SIX DOLLARS ($6.00). For those carrying a Certificate of TWO THOUSAND ($2,000) DOLLARS, you are required to forward the sum of FOUR DOLLARS ($4.00). For those carrying a Certificate of FIFTEEN HUNDRED ($1,500) DOLLARS, you are required to forward the sum of TWO DOLLARS AND TWENTY-FIVE ($2.25) CENTS. For those carrying a Certificate of ONE THOUSAND ($1,000) DOLLARS, you are required to forward the sum of ONE DOLLAR AND FIFTY ($1.50) CENTS, and for each member carrying a Certificate of FIVE HUNDRED ($500) DOLLARS, you are required to forward the sum of SEVENTY-FIVE ($0.75) CENTS. You are hereby requested to make remittance for assessment No. 17 as soon as possible, and in no event to reach the Grand Lodge later than January 20, 1909, as provided in Section 82 of the Constitution.

Yours fraternally,

J. J. HANNAHAN,
G. M.

W. S. CARTER,
G. S. and F.

SPECIAL NOTICE.—All remittances must be made by BANK DRAFT, MONEY ORDER, OR EXPRESS ORDER. Beneficiary members whose applications were approved after January 1 are not liable for this assessment.

Benevolent Assessment No. 2.

OFFICE OF THE GRAND LODGE OF THE B. OF L. F. AND E.
PEORIA, ILL., January 1, 1909.

To the Officers and Members of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that Benevolent Fund Assessment No. 2, amounting to $1.40, for the month of February, 1909, levied in accordance with a resolution adopted by the Eleventh Biennial Convention for the purpose of paying benevolent claims allowed by the Convention is now due and must be paid to the Financial Secretary of your Lodge not later than February 1, 1909, by all beneficiary members whose names appeared on the rolls of membership October 1, 1908.

Members initiated after October 1st are not liable for the foregoing assessment. All members who were expelled October 2, 1908, and readmitted in accordance with Section 200 of the Constitution are liable.

Any assessable member failing or declining to pay this assessment will be subject to the same penalty as provided for the non-payment of quarterly dues or any special or regular assessment levied by the Grand Lodge.

The Financial Secretary is required to make his returns to the Treasurer for the above assessment on or before the fifth day of February, to enable the Treasurer to forward his returns for the same so as to reach the Grand Lodge not later than February 20, 1909.

Yours fraternally,

J. J. HANNAHAN,
G. M.

W. S. CARTER,
G. S. and T.

General Fund Assessment Notice No. 1.

GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., January 1, 1909.

To the Treasurers of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that you are required to forward to the Grand Lodge the sum of twenty-five cents for General Fund Assessment No. 1 for each beneficiary, non-beneficiary and honorary member whose name appears upon the rolls of membership January 1, 1909. You are hereby requested to make remittance for General Fund Assessment No. 1 as soon as possible, and in no event to reach the Grand Lodge later than January 20, 1909.

Treasurers will remit General Fund Assessment of seventy-five cents for all members who have paid same in accordance with suggestion attached to official notice to members of General Fund Assessment No. 1.

In making returns for the above assessment, you will use the same set of statements upon which you make your returns for Beneficiary Assessment No. 17, and which are herein enclosed.

Yours fraternally,

J. J. HANNAHAN,
G. M.

W. S. CARTER,
G. S. and T.

General Fund Assessment Notice No. 2.

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., January 1, 1909.

To Officers and Members of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified that the sum of twenty-five cents ($0.25) General Fund Assessment No. 2 is now payable, and must be paid to the Financial Secretary of your Lodge on or before February 1, 1909.

Any member failing or refusing to make payment of the foregoing assessment will stand expelled, said expulsion taking effect February 2d. Financial Secretaries are required to deliver their returns for General Fund Assessment, together with the proper statements, to the Treasurers of their Lodges not later than February 5th, and Treasurers are required to forward the same so as to reach the Grand Lodge not later than February 20th, as provided in Section 165 of the Constitution.

All members, including honorary and non-beneficiary members, are hereby notified that they are liable for the payment of General Fund Assessments.

Yours fraternally,

J. J. HANNAHAN, G. M.

W. S. CARTER, G. S. and T.

(NOTE.—General Fund Assessments, of 25 cents per month, take the place of Grand Dues. Therefore, no more Grand Dues will be collected. Members who have already paid the 75 cents General Fund Assessment previous to January 1st will not be required to pay other General Fund Assessments until the assessment collected on or before April 1, 1909.)

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DOING GOOD

BY ADELBERT CLARK.

To do "no good" through all one's life,
Is something not yet done.
Each one, some earthly good must do
From golden sun to sun.
However small the act may be
Along Life's thorny way,
Some smile, or kindly word, or deed
Will glorify the day.

The simple flower by the road
That cheers the pilgrim's soul,
The hand that gives the crust of bread
And pays a poor man's toll,
Shall nowise lose his just reward,
For every act shall tell
Of holiness, and plead for him
To save his soul from Hell.

Somewhere in every human life,
Some bit of good is done;
Some battle for the higher pow'r
Man's loyalty has won.
And this alone shall break the chains
And set his spirit free,—
And it shall be his guiding star
Through all eternity.

Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa.

Matters for the Grand President should be addressed to Mrs. Georgie M. Sargent, 2815 Fourteenth street, N. W., Washington, D. C., and that for the Grand Secretary and Treasurer to Mrs. Mary E. DuBois, 1603 First street, Boone, Iowa.

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Greetings from Your Editress.

May the holiday season bring peace and happiness, a Merry, Merry Christmas, and a glad, happy New Year to every member of the Ladies Society.

The record of 1908, with all of its joys and sorrows, is closed, and another page is turned—a fresh, white page upon which to tell the story of the year. Hidden within it lie many possibilities. May we feel that whatever was good in the old year, for the soul of the New Year lives, and from our added experiences may we be able to accomplish much for the good of the Ladies Society.

It would be a good plan today if we would stop and count up our assets, so to speak; to pause for a moment's meditation as to whether we have for the past year lived up to our aspirations and professions. Have we not at any time harshly judged the actions of our sisters? Have we, indeed, at all times overlooked what we considered deficiencies? Have we given assistance and help, or have we stood by and criticised?

It will probably take but a moment for us to sadly determine that we decidedly have not always done those things which we ought to have done, and which we know we are capable of. I admit it would be more than useless to have expected it; but this is no cause for discouragement, for hope has always painted for us a brighter future which we anticipate, and the new year brings its resolutions for the building of a sweeter, higher character.

Better than all figures of increase, or showing of financial prosperity, if our lodges during 1909 can prove the quality of sisterhood; no harsh, unkindly word be spoken of each other. This is the spirit which I trust the Christmas and New Year has brought to us all.

Wishing for the best that the glad New Year of 1909 can bring to each lodge and to each member, I am,

Fraternally,
AGNES G. STRONG.

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Notes.

Happy New Year.

May the year bring joy and happiness to all.

Let this year keep contiuually before us our motto, "FRIENDSHIP AND CHARITY."

How about those resolutions for 1909? Have you started right?

Strive for better results this year in your own life and that of your Society.

Why not make 1909 the happiest year of your life? Try it by not saying unkind things about any one and wait for results.

Did you ever notice that criticisms and jealousy are almost synonymous terms?

The record for 1908 is closed. The only good to be gained by taking a backward glance is to profit by the mistakes made, and make resolutions effective by putting them into practice, and not allowing them to be mere theories.

Sisters, we ask for the new year upon which we are just entering your continued gifts in contributions of news and your patronage.

If success be ours, it must be gained through the kindness of the rank and file of the membership, and without this substantial aid our efforts, however conscientiously given, will prove an utter failure.

I wonder if members sitting at the side of the lodge room realize how very unpleasant and embarrassing it is to the officers, especially, to hear all through the initiatory work, the murmur of voices in whispering. One is surprised to see Past Presidents indulging in this sort of disorderliness, for it can be called by no other name. Visiting with each other is commendable, but there is a time and place for all things, and certainly during either the initiatory work or the business of the lodge, visiting should not be indulged in.

"Speak a shade more kindly
  Than the year before;
Love a little oftener,
  Pray a little more.
Cling a little closer
  To the Master's love;
Life below will liker grow
  To that life above."

The question is again and again asked us, "What do you do to hold the interest of your members?" We are sure from both experience and observation, that interest cannot be held by constantly introducing novelties. To our way of thinking that which wins and holds interest is intelligent, impressive ritual work, prompt dispatch of business, and the practical exemplification of the principles taught.

Please do not send to this department, for publication, obituary notices or cards of thanks, or resolutions of respect for deceased members. They are not of general interest, and if published at all should be confined to the local papers, where the persons mentioned are known. Were the publication of such notices in this department required in all instances they would exclude all else. If a member of your lodge has died, tell us about it in your letters, but do not send in resolutions drafted in memory of the departed.

Go lightly at the Christmas work. It is sinful to make it a burden as most of us do. A letter or card is enough in many instances to give much happiness.

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The Big Ten.

Below is given the membership of the ten largest lodges of the Ladies Society of the B. of L. F. and E., as reported December 1, 1908:

1.	No. 3, Hazel, Peoria, Ill......	125
2.	No. 142, Empire, Buffalo, N. Y.	121
3.	No. 60, Pride, Harrisburg, Pa..	102
4.	No. 70, Holly, Buffalo........	90
5.	No. 151, Missouri, St. Louis, Mo.	88
6.	No. 113, Ft. Orange, Albany, N. Y......................	82
7.	No. 51, Grayson, Denison, Texas	76
8.	No. 125, Charity, Jackson, Mich.	74
9.	No. 15, Forest Flower, Cleveland, Ohio	72
10.	No. 146, Virginia, Chicago, Ill.	71

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Mother Leach Injured.

The following clipping from the Sedalia Democrat Sentinel, Friday evening, November 27, 1908, tells of the serious injuries sustained by Mother Leach, and also to her little grandson on the same evening, by scalding. I know that I voice the sentiment of the entire L. S. when I bespeak for the injured ones a speedy return to health and happiness:

Mrs. J. A. Leach, better known as "Mother" Leach, is bedfast at her home, 1507 East Seventh street, suffering from injuries sustained in a ten-foot fall at her home early Wednesday morning.

She was standing on a stool in the summer kitchen of her residence, when the stool overturned, precipitating Mrs. Leach to the cellar, a distance of ten feet.

In the fall she received a painful gash one and one-half inches long on the back of her head, and her body was badly bruised generally, but she is resting well today.

Dr. A. H. Heaton dressed the wound, but Mrs. Leach will likely be laid up several weeks.

A second accident occurred at the Leach residence Wednesday evening, when Mrs. Leach's grandson, Frank Cunningham, son of Mr. and Mrs. R. R. Cunningham, overturned a bucket full of boiling water on himself, severely scalding both feet from his knees down.

Both patients are getting along satisfactorily.

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Notice.

All communications for the Grand President should be addressed to Mrs. Georgie M. Sargent, 2815 Fourteenth street, N. W., Washington, D. C.

Kindly notice changed address.

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New Year's Greetings from Sister Schoenell, Chairman of Grand Board of Trustees.

To the members of the Ladies Society I send New Year's Greetings, and may some new joy be found in each one's life.

New Year's! Another twelve months before us—one of joy or sorrow or failure, as fate decrees.

The year just drawn to a close is tempered with sadness at the thought of sorrow and bereavement that have entered the hearts and homes of some of our members, and especially that of our dearly beloved Grand President. It is not my purpose to bring sorrow anew to any sister or brother, but to extend our love and sympathy and point to you the Allwise Father, whose love is unchanging.

I think we would all be happier if we would more freely express the kindly feeling which exists in our hearts for each other; if we would speak approving and cheering words while they can be heard and hearts be thrilled and made happier; for what is life without the sweetness of love and sympathy? May the faults of our sisters be written upon the sand and their virtues upon tablets of love. Let us not forget that the deeds of today make a history for the future and let our highest and noblest teachings be exemplified in the motto, "Friendship and Charity."

To my associate officers and brothers and sisters of different societies I visited, I extend a fraternal love; you have manifested your kindness and good will in many ways.

Perhaps the most pleasing duty connected with the office of Grand Trustee is the official visit to the office of G. S. and T., at Boone, Iowa, when, as a helper, she can inspect the affairs of the Grand Lodge and assure herself of its prosperity. I shall always remember the many words of encouragement spoken and the friendships formed, and the generous hospitality extended to me in homes of many members while in Boone, for which I am truly grateful.

There have been many pleasant features connected with my work in the Ladies Society, many things which in years to come I can look back upon with real pleasure, and among the dearest I am sure will be the remembrance of my own home lodge. They are a dear lot of sisters and I have not words to express my thanks to them. I cannot close without tendering to our faithful Grand President and Grand Secretary and Treasurer my sincere thanks for the prompt service and ready response to every demand made upon them; they have always been willing and ready to lighten our duties and never too busy to give good counsel. To you, my sisters, I am indebted more than I have words to express.

To each and every member of the L. S. may the new year bring joy and happiness, and may this be the banner year in the Ladies Society.

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Now and Then.

When my restless hands are folded across
my silent breast;
When my pen, so seldom idle now, shall
be for aye at rest;
When the snowflakes flutter downward,
or the wind, with rushing wave,
Shall blow in all its fury upon my sodden grave.

When, guided yet by sturdy men of
muscle, brawn and brains,
The cars will still be speeding across the
Western plains:
I ask no greater favor than peacefully to
lie
Within some graveyard's mossy slope,
where the trains go daily by.

If ever soul be granted the freedom from
above
To view with care and tenderness the
friends they used to love,
Then I shall ask that boon from Heaven,
no matter what its joys,
That I may have the friendship still of
the kindly Railroad Boys.

I care not where they lay me down;
where the summer sun shines
forth,
Or where the Western breezes blow, or
in the icy North;
I care not for a marble shaft, nor granite
headstone crave;
But let a really honest tear be shed upon
my grave.

And when the trumpet's blast shall shake
that little grassy mound,
And when the day of reckoning comes,
may my record clear be found;
And as with radiant smiles we meet and
grasp each other's hand,
May I then, as now, be the honored
friend of the noble railroad band.

MRS. HENRY B. JONES,
Washington, Ind.

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The Little Blue Cup.

Among my most treasured keepsakes I value a little blue cup and its tiny saucer, and it came to me in this way:

My husband at one time was firing an engine on a train that made daily trips to one of the large cities of the Empire State. Both he and his engineer were very fond of children, and every little fellow who happened to be around in the vicinity of the roundhouse invariably left his play and climbed upon the engine to ride about while they were putting away their train, as in those days the road crews did their own work.

There was one little boy to whom my husband was particularly drawn, and as his dear little face was the dirtiest of the lot, he at once named him "Dirty Face," and as long as the acquaintanceship lasted, never called him anything else. He was the brightest one of them all and all through that long, hot summer the happiest in the bunch. But as the fall came on and the days grew colder and Dirty Face shivered in his little thin jacket, he didn't seem to have so much to talk about, and when his young comrades told of their plans for Christmas he never had anything to say. At last my husband said to him, "Well, Dirty Face, what are you going to have for Christmas?" He replied, and his little voice shook, "The foundry's shut down and pa can't git any work, and ma can't work any more since the new baby came."

My husband came home that night and told his story and we at once went to work planning a Christmas box for Dirty Face. We did not know how many children there were in the family, but of four we were certain. So, after we purchased a serviceable gift for each, we added a generous supply of candies, nuts and fruit and a pretty rattle for the new baby.

On the day before Christmas, when Dirty Face climbed upon the engine, my husband gave him the box. For a moment he was so surprised he could not speak; then he held it out before him and shouted: "Boys, we can have Christmas, too. Won't my little sister be glad?" And he started for home as fast as he could run. And not until the day before New Year's did they see him again. That day he was waiting for them in another part of the city and waving his little hands excitedly for them to stop.

My husband helped him up on the engine and he asked them if he could ride across the bridge, as he did not have the penny for toll, but just money enough for something he wanted to buy. Of course they carried him. "And mind you wait for me to go back," he said, as he slipped to the ground and dashed up street. He did not keep them waiting, however, and on his return laid a small package in my husband's hand, charging him not to open it, nor break it, as it was a New Year's gift for me.

It was that dear little blue cup and saucer, and the little fellow earned it by selling papers on the streets, and I am not ashamed to say that it received its first washing with tears that fell upon it as I thought of little Dirty Face in his thin, old jacket out in the bitter cold earning the money to buy it for me.

IMOGENE BATES.

*The Largeness of Life.**

To consider one's self but an individual is to narrow and limit the confines of one's horizon; to consider one's self a part of a wonderful, magnificent, generous whole is to comprehend the real breadth and width and depth of life. "Man realizes himself," says Edward Markham, "only when he identifies himself with the common life. There is no rest for the man, but in fellowship in the beautiful concord, sympathies, and services of a comrade kingdom." And "fellowship," agrees William Morris, "is heaven, while lack of fellowship is hell."

It is only in common love, common service, that we are ever thrilled with tne largeness of life. The beauty, the ecstasy, the uplift, lies not in isolated opportunities, but in opportunities as connected with the pulsating world. There is danger in achievement when achievement makes for personal benefit alone. The man who accumulates riches at the expense of others has not made a success of his life. He has made but a dismal failure. He has starved his heart, warped his intellect, mutilated his better impulses, until the better self that might have been a power for good lies at his feet, misshapen and lifeless. The woman who overrides friends, family and conscience to better her social or financial position is not a success herself or to anyone else. She is worse than a failure, for her failure reflects, not upon herself alone, but upon those weaker sisters who follow in her train.

There is growth and culture in self-abnegation. "Godliness is profitable for all things," said Paul. "Having promise of the life which now is, and the life which is to come." It is necessary oft-times to yield in order to win. "He that loses his life shall find it." We have great need to grow, to get away from the narrow outlook which most of us put upon life. Too often we form a telescope of our hands over our eyes, and tell each other what the world is like. We need to get upon the mountain top and sweep the horizon with one gaze. Life is big with purpose, and we shall not graduate until we step out of this tenement into the broader school beyond.

We must learn that there is good in everything. Whether in life or death, joy or sorrow, in sin or shame, always there is good. We must seek for it, for the lesson to be learned, the breadth of view to be gained. "Everything that happens to us," says Goethe, "leaves some trace behind it; everything contributes imperceptibly to make us what we are." Experience should not embitter us, narrow nor inflame. Let us learn to

"Listen to the murmured blessing
Sorrow always brings."

Things are pretty nearly as they should be. "Upon the ephemeral Is," says Edward Markham, "presses the eternal Ought. Behind this Ought presses the shoulder of God," and out of this he evolves the creed, "What ought to be will be." We get what we deserve and deserve all we get, if not for one reason, for another. "If a man is unhappy, this must be his own fault," says Epictetus, "for God made all men to be happy." That is a beautiful thought which the Concord sage extends to the longing heart. "The things that are really for thee gravitate to thee. O, believe as thou livest that every sound that is spoken over the round world which thou oughtest to hear will vibrate on thine ear."

There is a calmness in our fitful career when we realize that life is not a narrow path. There is a steadfastness to lay hold of when we look into the vastness of its reaches and remember that it is not all to be lived in a day. We can afford to take time to lay hold of things. Not material things; for while we much accumulate matter, being earthy, it is the spiritual accumulation that will last.

"A true love of others," says Van Dyke, "is a counterpart of love of self." To be loved is better than to have the world's riches of silver and gold. And to have a heart of love is a treasure of priceless value. "A man's growth," says Emerson, "is seen by the successive choirs of his friends." A beautiful phrase that! "The choir of his friends." Chanting in the voice of love from the treble of childhood up through the successive stages to the noble chorus of manhood and womanhood. "To be able to make friends," says the author of "Tom Brown," "is God's choicest gift." To look into the eyes of this one, to clasp the hands of that, to sit content by the side of another, with words or without, it does not matter—we understand. This is the communion of saints."

To appreciate one's gifts and make the most of them is not an endeavor toward individual success alone. For to make the best of them we must include every other individual who comes into contact with the application of our talent. These are the things we shall appreciate and lay hold of when we step out into the open and learn to interpret life largely. Then we shall know peace and calmness and trust, and as the steady light of courage and hope radiates from our far-seeing eye, we shall be able to say in the sure faith of Whittier.

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*Della Thompson Lutes, in The Pilgrim.

"I know not where His islands lift
Their fronded palms in air;
I only know I can not drift
Beyond His love and care."

So shall we travel onward to the full harvest tide of our years, and viewed from the mountain top of life shall be very broad in its purpose, with an immeasurable breadth to its possibilities and an unfathomable depth to its meaning—a view in which it is impossible to tell where sky and horizon meet.

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Joint Meeting.

The sisters of 99 L. S. 58 held a joint meeting at Odd Fellows Hall Thursday evening, November 5, our President, Sister Lusink, and Master Cleary in the chairs.

A very good meeting was held, and we decided to hold a joint meeting on the first Thursday in each quarter.

Each member was pleased to learn that we were to purchase a piano.

As we had a number of visitors in waiting in the anteroom, the session closed with the usual ceremony and the doors were then thrown open to our friends. A very fine program was rendered, after which we adjourned to the banquet room, where a delightful banquet was served. Much credit is given the committee in charge for the success of the evening—and as we journey through life

Let us live by the way;
Don't trouble tomorrow—
Today is today.

KITTIE ACKER,
Rochester, N. Y.

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Rocky View L. S. 192.

Rocky View Lodge No. 192 was organized on the 19th day of August, 1908, with ten charter members.

The evening of the 20th we gave a joint social evening and dance in honor of our Organizer, Sister McCambley, of Calgary, Alberta, which was thoroughly enjoyed by all.

On Wednesday evening, September 16, we again gave a dance, which was a great success, both socially and financially. The brothers of Lodge 559 were "kindness personified," doing all in their power to help us. It was with feelings of deepest regret that all heard the familiar strains of "Home, Sweet Home."

We held our first joint meeting on Thursday evening, October 1, which, although quite new to us all, was very much enjoyed.

We hold our meetings on the first and third Wednesday of each month. Although we are but amateurs in lodge work, yet all are fond of it and are earnestly striving to make our little lodge a great success.

With best wishes to all sister lodge and to our Editress.

Rocky View, Cranbrook, B. C.

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Decided Success.

Swannanoa Lodge 246 and the brothers of Blue Ridge Lodge 455, gave an oyster supper and entertainment at the I. O. O. F. hall on Church street, Saturday night, November 21. Supper was served from 5 p. m. to 11. The affair was a decided success.

Judge Thomas Jones and J. Frazier Glenn were the speakers for the evening. Both speakers dwelt on the progress of the organization and the great good it has done in bringing the men of the trades into closer touch with each other. During the entire evening the hall was thronged with people—at the refreshment tables or sitting about the room.

Music was furnished by a string band. Quite a neat sum was realized.

MRS. DORCAS WALSH,
Corresponding Secretary,
Asheville, N. C.

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Eccentric Lodge No. 245, Waseca, Minn.

Eccentric Lodge 245, Waseca, Minnesota, was organized September 23, 1908, in A. O. U. W. Hall with Sister Chapman of Minneapolis as Organizer. There are twelve charter members, and we meet twice a month—the second Monday and fourth Sunday—in the A. O. U. W. Hall. The brothers meet in the same hall at the same time—we in the outer room and the Brotherhood in the main hall.

To raise money for our treasury we have been giving afternoon coffees, charging ten cents for the lunch, and spend our time sewing on quilts, etc.

We have given a dance and oyster supper and sold one quilt which we had pieced and put together.

The stork visited two of our sisters also, leaving a boy at one home and a girl at another, all doing nicely.

ECCENTRIC LODGE.

* * *

Greetings from L. S. 155.

No. 155 sends New Year greetings to all members of the Ladies Society. We are also glad to inform you that we have a prosperous lodge and a growing one, too. At our last meeting we had the pleasure of conducting two candidates through the mysteries of our Order and ballotted on three more petitions for membership.

Our present record shows that we have initiated fifteen new members during the past year.

We have had so many social affairs during the past year, that it would take up too much of our valuable space to tell you all about them. We have had excursions, picnics, car rides, dances, whist parties, suppers, surprise parties and now we are working for a fair to be held in early spring.

The second Saturday of each month we hold a dance and whist party, which are always well attended.

We meet the second and fourth Tuesday of each month.

We, too, mourn the death of a dear sister, Maggie Wallace Sprague. She passed away after a short illness from pneumonia, being unable to keep up the struggle of such a hard disease. She was a bright and promising member of our Society, and it is the first time we have had the sad duty of draping our charter in the six years of our existence.

We extend our heartfelt sympathy to Brother Sprague in his sorrow over the death of his beloved wife.

Sunset and evening star, and one clear
call for me!
And may there be no moaning of the bar
when I put out to sea;
But such a tide as, moving, seems asleep,
too full for sound and foam,
When that which from out the bounding
deep turns again home.
Twilight and evening bell—and after that
the dark!
And may there be no sadness of farewell
when I embark.
For tho' from out the bourne of time and
space, the tide may bear me far,
I hope to see my Pilot face to face when
I have crossed the bar.

MRS. MABEL E. WHEELER,
Somerville, Mass.

* * *

The Faithful Few.

When the meeting is called to order,
And you look around the room,
You are sure to see some faces
From out the shadows loom
That are always at the meetings,
And stay until it's through;
Those you sure can count on—
The always faithful few.

They fill the vacant offices
And are always on the spot,
No matter what the weather,
Tho' it may be awful hot.
It may be dark and rainy,
But they are tried and true,
The ones that you rely on—
Always the faithful few.

There's lots of worthy members
Who come when in the mood,
When everything's convenient;
Oh! they do a little good.
They're a factor in the Order,
And are necessary, too;
But the ones that never fail us, are—
The always faithful few.

If it were not for these faithful ones,
With shoulder at the wheel
To keep the Order moving
Without a halt or reel,
What would be the fate of the Order
That have so much to do?
They surely would go under—
But for the faithful few.

MRS. IDA RODERICK,
Chicago, Ill.

* * *

Letter from 129.

After reading the letters from the sisters in the Ladies Department I thought perhaps they would like to hear a word from us. We are having good times, and have added three new, strong links to our circle chain.

We always serve ice cream and cake after each initiation.

Our lodge is in sorrow for our dear departed Sister Margaret Smith, who died at sea when but twenty-four hours from landing in Europe, where she was to meet her father and mother, whom she had not seen for years.

Our lodge has lost a good and faithful sister, who was always ready to lend a helping hand in all that we undertook.

Sister Smith's family has our deepest sympathy.

Dearest sister, you have left us,
And your loss we deeply feel;
But 'tis God that has bereft us—
He can all our sorrows heal.
Yet again we hope to meet you,
When the day of life is fled,
And in heaven, with joy to greet you,
Where no farewell tears are shed.

TINA GOW,
Jersey City, New Jersey.

* * *

From Forty-Sixth Star—No. 237.

Is "Friendship and Charity" our motto indeed?
Do we help our sisters when they are in need,
And on lodge day are we ever there,
Do we share with our sisters
Peace, joy and despair?

Do we for each other care, each other's burdens bear?
Will the love the Savior gives,
Show us how true we all can live?
Now, let us ever willing be
To assist our brothers true,
For you see they are always ready
To prove what they will do.

Why not the sweet, the blissful love
Fill every heart and tongue until
All the wives and mothers come
And join us in our sacred song?

When free from every scorn and pride,
Our wishes all above;
Each can her sister's failings hide,
And show a sister's love.

Blest be the dear uniting love
That will not let us part;
Our bodies may be far removed,
But still be joined in heart.

MISS EVA HIBDON,
Sapulpa, Oklahoma.

From L. S. 191.

Not wishing to have our sister lodges think we are not still trying to keep up with the good work, will write a few lines, as it has been quite a long time since we have been heard from.

We were so pleased to have with us again Bro. A. P. Kelley, Brother Pyle of 284 being so kind and thoughtful in inviting Brother Kelley and all of the sisters of Catharine Hannahan Lodge 191 to his home, where we spent a most enjoyable evening. Brother Kelley spoke so encouragingly—telling us of all the good that had been done and could still be done by our auxiliaries all over the country if we would all work in harmony. I am sure we all found a good lesson in his beautiful words, which came right straight from an honest heart.

We are now planning for a whist to be held in our lodge room after our next meeting.

We are going to have a Christmas grab-bag and invite in all of the brothers of 284.

We hope to have the banner lodge in the coming year.

Wishing all sister lodges success, also one and all a truly Merry Christmas and Happy New Year.

* * *

Letters from Friends.

FROM L. S. 51—(*Mary Platt, Denison, Texas.*) Wishing to identify No. 51 with the other lodges of our Sisterhood, we venture this letter to the Magazine. We are very much interested. Although the weather is very warm we still manage to meet each meeting day in the dear old lodge room. We have applications for membership at nearly every meeting. The attendance has not been what we should like to have it, still we are doing well, considering the heat and sickness among our members and their families.

It has been some time since we held joint installation with the brothers, but we want you all to know what a good time we had when the past officers of both lodges installed the new set of officers. Our retiring President, Sister May Gensel, was presented with a handsome Past President's pin, following which a splendid program was rendered and refreshments served, after which music and dancing was indulged in until a late hour.

But in the midst of our merry-making comes a note of sadness. We do not forget our brothers and sisters whose homes the grim reaper death has entered and bore away the ones so dearly loved. While we sympathize with them in their sorrow, we can never know its full meaning until we, too, are called upon to give up our loved ones. But, brothers and sisters, look to a higher plane than this for solace and consolation, and try to remember the words of the poet who wrote:

"There is no death;
The stars go down to rise upon a fairer shore,
And there in heaven's jeweled crown
They brighter shine forevermore."

And last, but not least, we will soon meet in that Supreme Lodge above, where not only brothers and sisters meet, but all whom we hold dear will be there to meet us, where we will never say good-by.

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FROM L. S. 65—(*A Member, Nevada, Mo.*) To say that peace, harmony and good-will prevails between the members of Carnation Lodge and the brothers of No. 371, is speaking truly. An invitation from the brothers to be present at a banquet which was quickly accepted; also an invitation from them to meet in joint meeting, which we did, and were so pleased to hear Brickhouse in his pleasant and able manner install the officers of 371. He made a fine talk for the good of the Order, which was appreciated by all, after which the doors were thrown open and a social time enjoyed.

It was with regret we noticed some vacant places, as Brothers Schader, Innis, McBride and others have gone to make their homes elsewhere.

Both lodges are gaining slowly but surely in new members.

And now, having written of our pleasures and business matters, I come to the sad part of my letter, for however gay we may be, surely

"Into each life some rain must fall,
Some days must be dark and dreary."

It was with sad hearts we draped our charter in mourning for our dear departed sister, Myrtle Ashford Thompson, who has been a patient sufferer for over two years; she was called home, and a gloom has been cast over our lodge and community. Sister Thompson was a good Christian, having a strong faith in God, and lived for the good she could do for others. We wish to extend our sympathy to Brother Thompson and other relatives, and commend them to her Father, who doeth all things well. We took her to Chanute, Kansas, and she was laid beside her mother.

"She sleeps. Sweet flowers, beloved by her, will bloom upon the sod above her head.
Her body sleeps, her spirit rests with God. She is not dead."

The sentiment of this old hymn seems especially fitting after her sweet, quiet life:

Sunset and evening star,
And one clear call for me;
And may there be no sadness of farewell
When I put out to sea.

◆ ◆ ◆

FROM L. S. 84—(*A Member, Pine Bluff, Arkansas.*) Will endeavor to tell you what grand old times the Marechal Neil sisters are having. We are but few, but we always manage to spend our idle time with most delightful enjoyment with one another.

On our installation day we had a very pleasant time. After the officers were installed we spent the rest of the afternoon with our sister Secretary. We presented her with a beautiful membership pin, which was presented by our President, Sister Ellis, in a very pretty little speech. We feel greatly indebted to our Secretary for faithful and efficient work. We also presented our President with an emblematic pin.

Sister Huber delightfully entertained the sisters and brothers at a supper. The tables looked very inviting with their choice cut flowers, and the guest of honor on this delightful occasion was Sister Lallam, a member of Grayson Lodge 51, Denison, Texas.

Our lodge is growing slowly but surely. We have two applications on the table now and prospects are good for several more real soon.

With best wishes for all sister lodges for a happy, prosperous New Year.

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FROM L. S. 49—(*Annie M. McCullough, Camden, N. J.*) As you have not heard from us for some time, I will let you know that we are wide awake, just the same. Some of our members are a little slow in attendance and do not come very regularly, but we hope they will realize what they are missing by not attending regularly. We that attend the meetings enjoy them very much, as they do us lots of good in every way.

Our President, Sister Lang, is always at her post and is a splendid President; and our Secretary, Sister Price, has not missed a meeting since our lodge was organized, but I must say our officers are all regular in attendance.

Our Vice-President is mourning the loss of her father. She has our heartfelt sympathy; also Sister Campbell, in the loss of her best friend we have, a mother.

We now have twenty members, and are expecting two more right soon.

The stork visited the home of Brother and Sister Danford. We hope that papa will soon be able to mind the baby so she can attend our meetings, and not only Sister Danford, but all of our members.

Now that winter is here we hope that every member will get right down to work and be interested, as I am sure we ought to be.

We meet every second and fourth Monday of each month, at 8 p. m., and are always glad to welcome visitors.

Wishing all other sister lodges the best of success for the New Year, and also our dear Editress.

◆ ◆ ◆

FROM L. S. 187—(*Laura E. Stoner, Columbia, Pa.*) As it has been some time since we were heard from through the Ladies Department, and as I have been appointed correspondent for another year, I will just write a short letter to tell you of the nice social times we are having.

On the 8th of October we had a very good report from our delegate, Sister Barefoot. We had very much business, as it was our regular meeting day, but we hustled everything through to hear from Sister Barefoot. After lodge closed we had refreshments, which were enjoyed.

On October 21, Sister Harriett Wein gave a sauerkraut supper in honor of her birthday. There were a hundred of her neighbors and friends and members of her lodge, L. S. of the B. of L. F. and E., and G. I. A., and both Brotherhood lodges, and oh! the good things to eat and the nice social time enjoyed will always be a sweet memory. I think if we could all have such large birthdays it would be splendid. The evening was spent in social conversation, games, vocal and instrumental music. Sister Wein received some very beautiful presents. We wish Sister Wein and her family many years of happiness and prosperity.

We have several sick sisters in our lodge, and we hope they will soon be restored to health.

There is renewed interest in our lodge meeting now. We hope the good work will continue. We would like to see all of our sisters at every meeting, so each one come out to our next meeting and you will get a surprise.

I will not take any more of your valuable space, but will close with wishing all sister lodges a merry, merry Christmas and a happy New Year.

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FROM L. S. 18—(*Nannette Hawkins, Silsbee, Texas.*) Here's another lodge that is not dead, but has just neglected this part of its work so long until no one knows who we are or what we are doing.

We have a pleasant little lodge of about thirty members, with two new members and three applications. That isn't bad, is it?

The brothers have been real accommodating in securing new candidates for us —by matrimony. Nearly all (the large majority at least) of our boys are staunch B. of L. F. and E. boys.

We have quite a social lodge, and try to make the boys enjoy our joint meetings, socials, etc.

On the 22d of September we gave a supper and charged twenty-five cents for same, and gave them all they could eat. We are now planning a social joint meeting and a dance.

The stork visited the home of our sister Collector, leaving a future Brotherhood man. The lodge presented him with a pin with his name "Jack" engraved on it, in token of faithful services rendered by Sister Stephenson, his mother.

We have practically the same officers as last term, and all members seem to be pleased. Our officers are all good workers, especially our worthy President, Donie Fowler.

We meet the first and third Friday afternoon at 3 o'clock, and the latch string is always out for visitors. We hope to be with you in the Magazine real often.

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FROM L. S. 206—(*A Member, Creston, Iowa.*) A very pretty and interesting meeting was held Thursday afternoon by the members of Crest City Lodge 206. Mrs. T. A. Richards, the retiring president, after faithfully performing the duties of this office for the past two years, as a slight token of the love and esteem in which she is held by all officers and members of this society, was presented with a sterling silver spoon.

A pretty custom of this lodge is that of presenting to each new baby a baby spoon, and on this occasion a spoon was presented to the little daughter of Mr. and Mrs. J. Shephard, and also to the little son of Mr. and Mrs. A. Franklin, formerly of this city but now residing in Sidney, Iowa. The installation of officers for the coming year took place, and reports from the board of trustees showed this society to be in a flourishing condition. The officers elected for the coming year are as follows: President, Mrs. Chas. B. Heflin; P. P., Mrs. T. A. Richards; V. P., Mrs. J. I. Boyd; Secretary, Mrs. Jos. Shepard; Treasurer, Mrs. H. H. Kellog; Collector, Mrs. T. A. Richards; Chaplain, Mrs. J. J. Stump; Guards, Mrs. A. Franklin and Mrs. J. O'Hare.

On September 23 a pretty little daughter arrived at the home of Mr. and Mrs. C. B. Heflin. It is needless to add that the coming of this little one brings joy and gladness to the hearts of her parents, and we hope she may some day become a true and earnest worker in the L. S.

Business on the road is very good now, and our boys are of course kept busy.

Girls, let us make our homes "Home, Sweet Home," true in every sense of the word, and when our dear ones "get in" let him find a smiling face and a cheery welcome, and thus by so doing not only help the cause of our Ladies Society but lighten if possible the daily burdens so bravely shouldered.

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FROM L. S. 205—(*Magazine Correspondence, Calgary, Canada.*) As Magazine correspondent appointed last July, I am rather late in making my appearance, but I trust you will make room for me just the same. As I imagine it has been some time since this lodge was heard from, it might not be out of place to say that we are a flourishing little lodge of seventeen members, with five applications on file, and some of these applicants we expect to initiate at our next meeting; also have several more applications in prospect, so hope to have quite a respectable membership in the near future.

We draped our charter for the first time in our history last July for our youngest and brightest member, Jennie Shepard, who met death under rather peculiarly sad circumstances, being drowned while on her wedding trip, a bride of three weeks. This was a very painful shock to us all, for individually we had a great affection for Jennie. She was so pretty and bright and helpful. Her death has left a gap in our circle that will not soon be filled. Our lodge and the brothers of 365 took charge of the funeral arrangements, and we extend sincere sympathy to the youthful bridegroom and bereaved mother.

In August we had a little function of a very pleasant nature when the members of No. 205 met at the home of Sister McCambly and presented her with a beautiful pearl sunburst pin as a token of our esteem and appreciation of the faithful work done by her as president of our lodge ever since our organization. The presentation was made in a most admirable manner by our secretary, Sister Allott, and feelingly responded to by Sister McCambly.

Lodge 205 is glad to take this opportunity of publicly thanking the brothers of 635 for the generous donation made us of the proceeds of the last annual ball and for the kindly way in which they have always come to our assistance in every possible way. I assure you brothers we have always appreciated it.

We are looking forward to many pleasant social events this winter and will likely be heard from again.

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FROM L. S. 201—(*Mrs. Ida Roderick, Chicago, Ill.*) Having not heard from Pride of 188 Lodge 201 I venture to write and let our sister lodges know a few things we are doing. We are full of life and the "goat" is always ready to do his part of the work. If you want your lodge to be a success you must all put your shoulders to the wheel. Officers cannot do things without your assistance, and above all remember the obligation you took when you became a member. Brothers, forget and forgive and try to help us. Get your mothers, sisters and wives to join our auxiliary. Remember three or four do not make a whole lodge. If you have a personal grievance against a sister don't let the lodge suffer. Have a heart-to-heart talk after meeting and then shake hands and be friends.

We are giving socials at different members' homes once a month for the good of the order. Sister Taylor entertained November 3, and I think gatherings like these at different members' homes serve to create more social feelings among members and cause better attendance at the meetings.

Our worthy president, Sister Cleveland, is working hard to make this the banner year. We are very sorry to say that many of our members have gone west to the new extension. Sister Middleton, our worthy secretary, is one of the many, and we elected Sister Dixon to fill the vacancy.

We held a joint meeting with the brothers of No. 188 and enjoyed it very much. Our worthy master, Brother Winslow, and wife rendered a vocal solo which was much enjoyed.

Just a word to eligible members in our city who for some reason or another have not joined our sisterhood. We will only be too glad to call and talk the matter over with you if you will send us your address or telephone us.

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FROM L. S. 231—(*Maude M. Theabald, Sacramento, Cal.*) We are a year and a half old now, and it is about time we acquainted our sisters elsewhere with the progress we have made in that time.

Organized on August 7, 1907, with seven charter members, we have grown to twenty-nine and expect to number forty by the time we have accepted the applications on hand.

Our generous brothers of 260 paid all of the expenses of organization and placed fifty dollars in our treasury for a start, and they expressed themselves satisfied with the result, as they report a decided increase in attendance and membership since our advent.

We have held joint meetings once a month during the two winters past, and always provide something good to eat and a pleasant entertainment. We are finding it a good plan to have our meetings the same night as the brothers and in the same building. Attendance is better because of the social hour which follows once each month.

Last March we held our first annual ball in conjunction with the brothers of 260, and it was a splendid success, and we expect to make the next one in the coming spring even better if possible.

On October 31 we held quite a pretty Hallowe'en dance, and are planning something quite novel for the new year, of which you will hear later.

Our delegate to the recent Columbus Convention was Sister Rilla Phillips, whose husband, Bro. Albert Phillips, has been chosen Fifth Vice-President of the Brotherhood.

Sister Della Best has ably filled the office of president since our organization and has been most faithful to every duty. May the rest of us follow her example, and there will be fewer problems to solve in lodge work.

We will gladly welcome visiting sisters to our meetings, which are held in Foresters' Hall the first and third Wednesdays of each month at 7:45 p. m.

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FROM L. S. 89—(*A Member, Salt Lake City, Utah.*) As it has been some time since we were heard from I fear we will be forgotten if we do not let you know something of our goings on, and I take this opportunity of making ourselves heard.

We had in conjunction with the three Brotherhood lodges in this city and sister lodges of Ogden a pleasant outing at one of our famous summer resorts, and since then two socials and a card party.

We have initiated two new members, and one waiting admission at our next meeting and five applications on file.

We try to keep busy and not allow the brothers to forget they have a sister lodge here.

Trusting that the other sister lodges have as bright prospects ahead of them as we and with good will to all.

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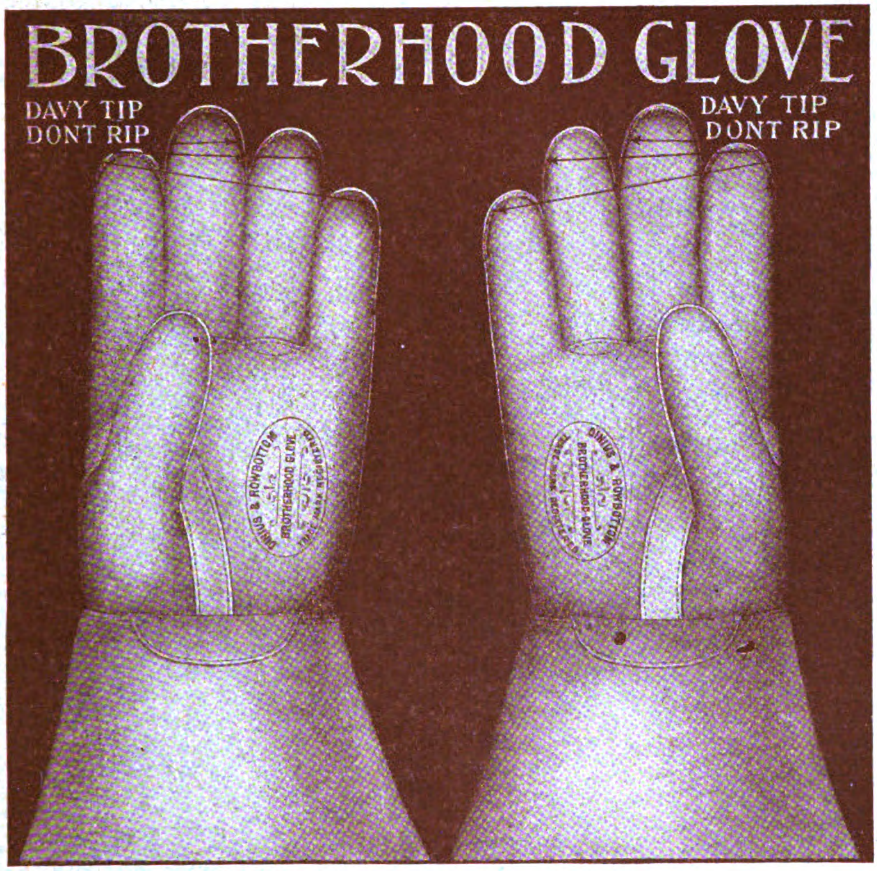
Death Report.

Florence E. Slaughter, Lodge 53, died October 28, 1908; cause, typhoid fever. Insurance, $400.

Margaret J. Smith, Lodge 129, died June 22, 1908; cause, diabetes. Insurance, $200.



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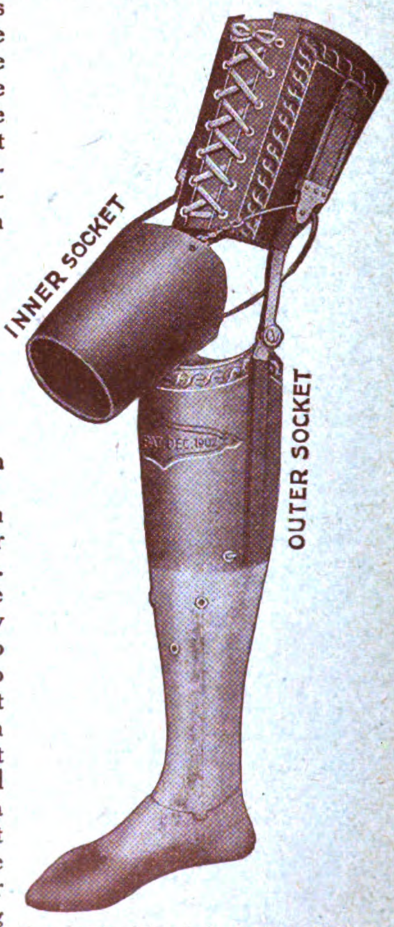
Talk No. 1.

A PRACTICAL TALK ON ARTIFICIAL LIMBS

By LOWELL E. JEPSON, M. S., the President of THE WINKLEY ARTIFICIAL LIMB CO.

MINNEAPOLIS, MINN., U. S. A.

During these past years we have been accorded the courtesy of occupying this same full page representation in your Journal, upon which have appeared various cuts and illustrations of our Patent Adjustable Double Slip Socket Legs and many photographs of Railway Brotherhood Men wearing them in active service and many personal letters of recommendation from them. During the past year we have (also) shown photographs of our new large fireproof manufacturing plant.



For amputation below the knee, with inside socket thrown out of its proper position in order to show its construction.

Insomuch as we have always received so large a patronage from those associated with the various Brotherhoods and have been receiving almost the entire patronage of many of the largest Railway Systems, there now being hundreds of conductors, engineers, firemen, brakemen and switchmen wearing our Double Slip Socket Legs in active service and on full pay, we feel that the merits of our limbs and the reputation of our company are broadly known and well established among railway circles.

There is no other line of work more strenuous or that gives an artificial leg a more severe test than active railway service. It is a common saying among Railway Men that "the best is none to good" and surely this is true concerning artificial limbs.

The qualities of an artificial leg are comfort, natural motion and durability.

The advantage of the Double Slip Socket is to secure an artificial leg that will not chafe, rub or irritate the stump or pull upon the end or make sore the places of bearing. Many who have worn Single Socket Legs know that the stump is not sufficiently protected, for no matter how closely the socket fits the stump, the act of walking forces the stump into the socket upon the bearings and at every step the stump works up and down to a greater or less extent in the socket and whenever the wearer steps upon a rough or uneven surface the stump and points of bearing twist upon the socket causing chafing, irritation and discomfort. We avoid all this by resting the stump in an inner socket made over a plaster Paris cast of the stump, which fits the stump most perfectly. This inner socket being suspended from above really takes the place of the stump itself, in fact the inner socket and the stump act as one and this inner socket being suspended in the outer socket, in the act of stepping moves up and down and twists in the outer socket; bringing all the friction between the two sockets instead of between the socket and the stump. We feel warranted in emphasizing the advantage of this swivel or rotary motion between the sockets, obtained only in our Double Slip Socket Leg, in which the inner socket is suspended from above. The relief and comfort afforded by bringing this twisting motion between the two sockets is equal to that of the up-and-down motion, as most of those having had experience in wearing will substantiate.

(TO BE CONTINUED IN NEXT ISSUE.)

FEB 1 1909

BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine

TRADE MARK REGISTERED IN U.S. PATENT OFFICE

Published at INDIANAPOLIS, IND.
by the
Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

FEBRUARY 1909

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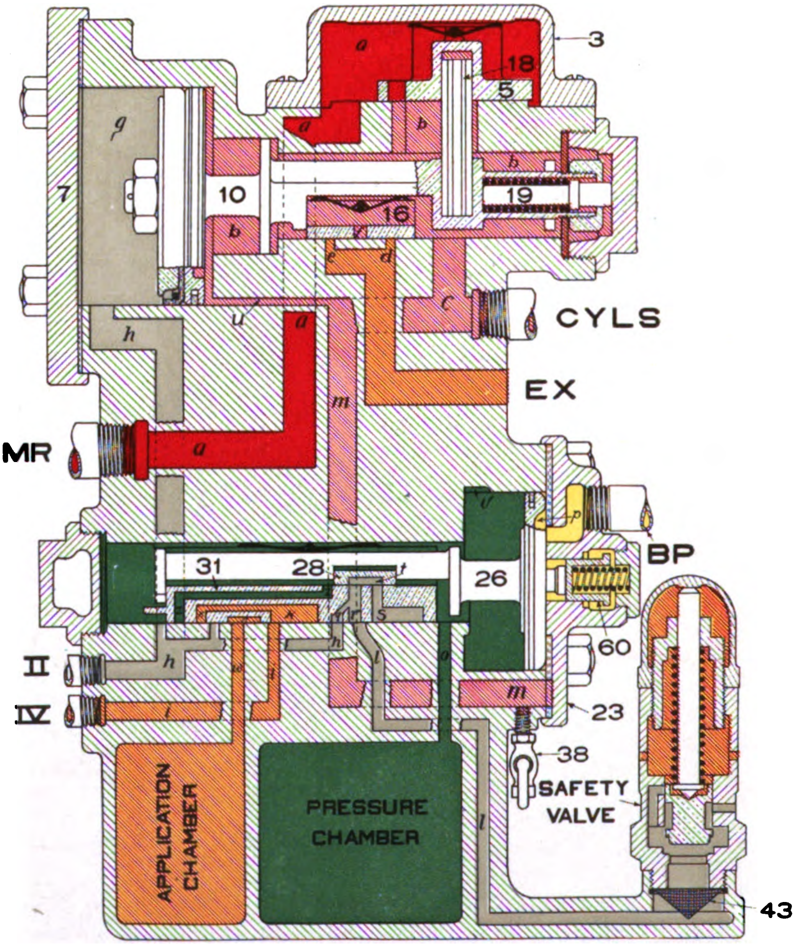

Locomotive Firemen and Enginemen's Magazine Educational Charts

WESTINGHOUSE AIR BRAKE SERIES

PLATE XLI—DISTRIBUTING VALVE, No. 6 ET LOCOMOTIVE BRAKE EQUIPMENT

(Emergency Position)

39
BROTHERHOOD OF

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TECHNICAL DEPARTMENT
JOHN F. McNAMEE
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Plate XLI—Distributing Valve, No. 6 ET Locomotive Brake Equipment (Emergency Position).

Plate XLI of the Westinghouse Air Brake Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts illustrates the equalizing and application portions of the distributing valve of the No. 6 ET equipment with both pistons at the limit of their application strokes, and the position is nominally that of Emergency Application; the position here assumed, however, will be the result of any brake-pipe reduction sudden and heavy enough to cause triple valves to apply with quick-action, or a service reduction of 25 pounds or more, or of 8 or 10 pounds only, when the equalizing-slide valve or the packing ring of piston *26* is sticking. The operation of the distributing valve differs, however, in certain functions, as to whether an emergency reduction of brakepipe pressure is made by the engineer's brake valve of the same engine, or by other means; to those familiar with the No. 5 equipment it will be remembered that the *maintaining port* was located in the distributing valve, and was open for action when the equalizing valve was in the emergency position—the equalizing piston at full stroke—*regardless of the cause of the application;* in the No. 6 equipment the maintaining feature has been transferred from the distributing valve to the automatic brake valve, and a *bona fide* emergency application has to be made to secure the benefit of the maintaining pressure—that is, the brake-valve handle must be placed in the emergency application position; an application made in this way will not cause the distributing valve to take any different position than if it were the result of a reduction made in any of the other ways mentioned above, but as its sphere of action will be increased thereby, it will be understood in referring to Plate XLI that the automatic brake valve of the same engine has been thrown to the emergency application position.

As the effect of the quick, heavy, brake-pipe reduction on the right of equalizing piston *26*, the pressure-chamber air drives the piston to the full limit of its travel, and so quickly, that in passing the service application position there is no time for the pressure chamber to lose any of its air through graduating port *z* to the application chamber; the graduating spring in sleeve *60* is compressed, and the equalizing-slide valve is drawn entirely past the left opening of port *h* in the slide-valve seat, cavity- and port-*k* in the face of the slide valve are blanked in effect as is port *z*, also, and the application chamber is isolated; the only effective connections established by the equalizing portion of the distributing valve in this position are the uncovering of port *h* in the slide-valve seat, as noted, and the connection of that port with the safety valve through ports *q* and *r* and port *l* in the seat. Pressure-chamber air flows past the left end of equalizing valve *31* into port *h* and through it to application cylinder *g*, and, not having the volume of the application chamber for further expansion, it is clear that the equalization of the pressure chamber air with the application cylinder will produce a much higher pressure against piston *10* than the application cylinder will have at a full service application (50 pounds at full service and 65 pounds at emergency applications).

The action of the application portion should be thoroughly understood by this time, as it operates in the same manner in response to any given pressure in cylinder *g*, no matter what the source of that pressure; piston *10* is forced to the extreme right in its travel, compressing the spring around stem *19* when the latter strikes, moving exhaust valve *16* to close the exhaust ports *e* and *d*, and bringing application valve *5* into position for supplying the braking pressure; the port through valve *5* is now in register with the port in the valve seat, and the main reservoir air from chamber *a* flows down into chamber *b* and thence through port- and passage-*c* into the pipe at *CYLS* that leads through branch lines to all brake cylinders of the engine and tender. Of course the application movement of piston *10* is quicker than in response to a service reduction.

The port through application valve *5* is of greater area than appears in the sectional side view, as it extends transversely to nearly the width of the valve, and in full application position as here shown is in register with a port exactly corresponding in plan and area, in the valve seat; from the center of the latter port a narrow, longitudinal opening is cut through the valve seat the distance necessary for the travel of application-valve pin *18*.

It will be noticed that the application chamber and port *n* are given the atmospheric color (orange), and understood, by reason of their being in open communication with the atmosphere before the emergency application was made, and are now isolated from any other connections as the result of that application; and the same applies to the distributing-valve release-pipe connecting at *IV* with the *dead* ports *i* and *k;* if the emergency application had been from any other source than the operation of the automatic brake valve of this engine, the pipe from *IV* would still be directly open to the atmosphere, but the rotary valve of the brake valve blanks the outlet of the distributing-valve release pipe when the handle is moved out of the *running position.*

In ordinary service the ET brake is in fact "the brake that won't come off" until the release is desired, providing that the "two little copper pipes"—the application cylinder pipe and the distributing- valve release-pipe—and the application cylinder cover, 7, are free from leakage; at an automatic application even that possibility of release through leakage is narrowed by the cutting-out of the distributing-valve release-pipe; and in case of emergency application, any ordinary leakage that there may be from the application cylinder or application-cylinder pipe is discounted by the supply of *maintaining pressure;* when the automatic brake valve is in emergency application position the main reservoir pressure upon the rotary valve flows through the maintaining port in that valve to the application-cylinder pipe and to the application cylinder; thus the application cylinder is "straight-aired" as well as the brake cylinders by main reservoir air at emergency applications, and it serves the purposes of preventing the safety valve from blowing down the application-cylinder pressure too rapidly at first, with the high-speed brake, and it insures a continually-holding locomotive brake by constantly maintaining the pressure in the application cylinder against leakage.

To prevent the application-cylinder pressure from rising above the adjustment of the safety valve (68 pounds), with the ordinary 70-pound brake, a small port is used to connect cavity *q* and port *r* in the equalizing slide-valve, of the right size to permit the application cylinder air from port *h* to pass to port *l* and escape through the safety valve at the same rate that the maintaining pressure is supplied through the port in the automatic brake valve.

In high-speed brake service, brake-pipe pressure is 110 pounds, and an emergency application equalizes the pressure chamber air with the application cylinder at about 93 pounds, and the flow of maintaining pressure is under a head of 130 or 140 pounds in the main reservoir; but the passage between cavity *q* and port *r* is so small that the flow of application-cylinder pressure to the safety valve is just enough greater than the supply through the brake-valve port to decrease the pressure in practically the same time and manner as is done by the high-speed reducing valves (used on cars, and with the ordinary automatic brake equipment on locomotives), until it is approximately 75 pounds; at that pressure the inflow of maintaining air at the high main-reservoir pressure used in high-speed service is just equal to the outflow through the small opening to the safety valve, and the pressure goes no lower, regardless of the adjustment of the safety valve at 68 pounds.

The sequence to emergency position of the distributing valve is Emergency Lap, which will be the subject of the next colored chart to follow.

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*Ohm's Law Made Easy.**

"E" stands for the pressure Which we are taught to use, Divided by "R," resistance, Will give us "C," the juice.	$\frac{E}{R} = C$
"C" is "E divided by R," With this we don't get very far,	$C = \frac{E}{R}$
But "E" is "R times C," you see,	$E = R \times C$
And "R" is "E divided by C."	$R = \frac{E}{C}$
"W," watt, is "Current times Electromotive force,"	$W = C \times E$
And "seven forty-six" of them The "Power of a horse."	$746 = H.P$

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Electrification of Terminals Proving Satisfactory.

From a report prepared by an electrical expert of one of the largest Western railroad systems, who was sent East to make investigation of electrical power on steam railroads, it appears that Eastern railroads which have substituted electricity for steam as a motive power are satisfied with the results, and believe that the change in large railway terminals is not only practicable but is desirable.

The decision of the expert is summarized, in part, as follows:

"From recent statements made by officials of the two systems, the New York Central and the New York, New Haven and Hartford, it appears that they are entirely satisfied with the electrical systems they are using and they regard electric traction as successful and efficient. They also argue that electrical traction has a number of advantages over steam for that particular territory covered.

"No reports are available that would indicate or would justify the conclusion that this service is less expensive than steam. The longer electrical equipment is used the greater is the cost of the upkeep and maintenance, and it will, no doubt, have to be tried out for some time longer before a correct comparison can be made of the relative expense of the two electrical systems or as between steam and electricity."

Regarding the cost of installation, however, it is stated that the expense of an electric engine is about 85 per cent. greater than that of a steam locomotive capable of handling the same train. The cost of equipping a six-car motor train, four motors and two trailers, is about 35 per cent. greater than that of a steam locomotive to handle the same train. The efficiency of the system, however, seems to be greater. Attention is called to the fact, for example, that the cars are repaired more expeditiously, as are also the motors, because complete sets of duplicate parts are kept in the shops and the broken parts are repaired at leisure after the car has been put back into service.

"It is the experience of these roads," states the report, "that electrically equipped cars are kept more continuously in service, give greater efficiency, make more mileage and cause less delays to trains. The multiple unit controlled suburban trains accelerate much more rapidly than do the steam trains, and in some instances the roads have been enabled to cut off from seven to ten minutes from their suburban schedules, and they can maintain better schedule time with reduced speed between stations on account of less time consumed in station stops. That is true of each system of electricity used. The multiple unit controlled system seems to be particularly adapted to suburban service, and has many advantages over locomotives."

The report describes the immense tractive power of the motors in use on the New York Central. Upon one occasion a train of nine Pullmans was stalled on a heavy grade in the Park avenue tunnel. An electric locomotive hauling seven

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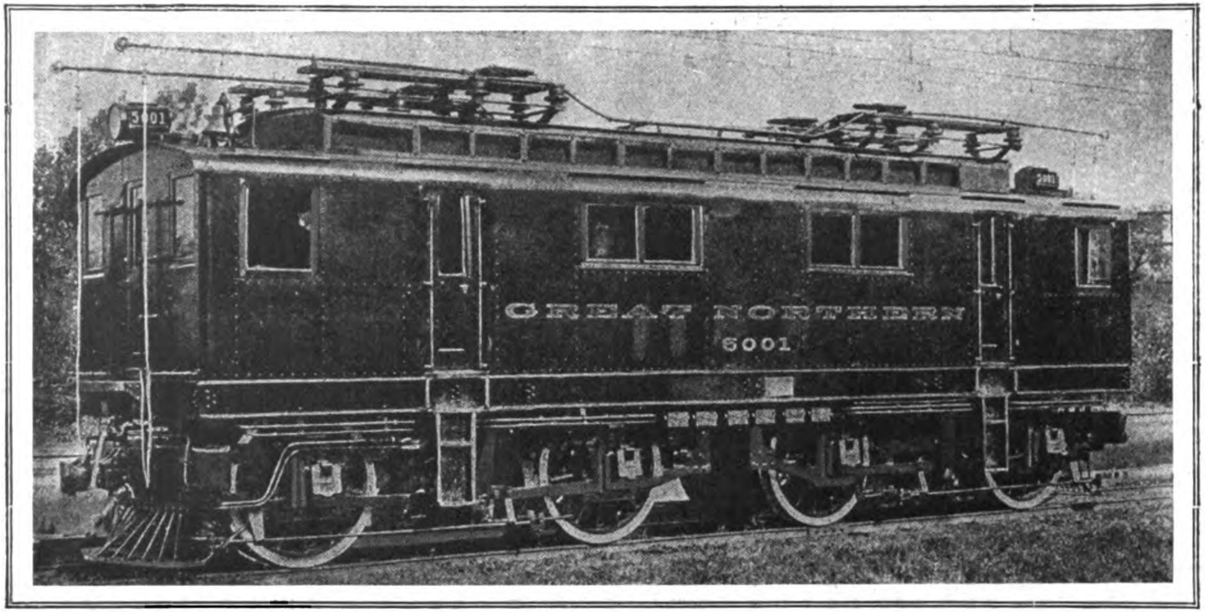
*By Carl Otto, Chicago, in Telegraph Age.



THREE-PHASE ELECTRIC LOCOMOTIVE FOR THE GREAT NORTHERN RAILWAY standard coaches hooked on and easily started the two trains up the steep grade at good acceleration and maintained it over a mile of such grade. Another motor hauled eighteen heavy Pullman cars which, the New York Central officials told the experts, would have required two steam locomotives.—Railway World.

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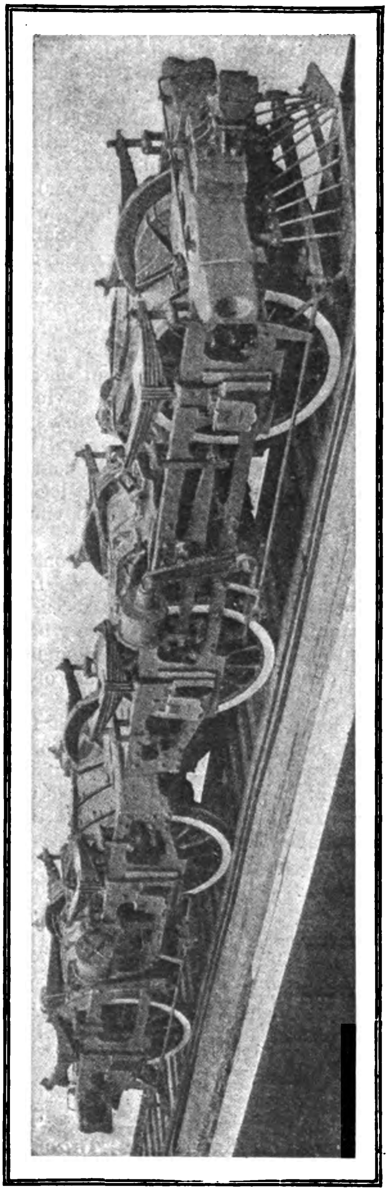
Three-Phase Electric Locomotive for the Great Northern Railway.

The electric locomotive illustrated herewith is one of several which were recently completed by the American Locomotive and General Electric Companies and delivered to the Great Northern Railway. They will be used for hauling freight and passenger trains through the Cascade tunnel, which is a little less than three miles in length. Having a grade of 1.7 in one direction and being so located as to offer serious obstacles to the introduction of ventilating shafts, the Cascade tunnel makes it very undesirable to operate steam locomotives through it. The installation of electric locomotives it is believed will overcome the latter objection perfectly. At present it is the intention to use electric locomotives through the tunnel only, although plans are under way for the electrification of several other grades in the vicinity.

These locomotives are of the double truck type, each truck having two pairs of driving wheels, and weigh 230,000 pounds. The two trucks are joined by an articulated connection and the draft gear and couplers are incorporated within their frames, which relieves the cab underframe of all pulling stress. In order to conform to the relative positions of the two center pins when rounding curves, created by the use of the articulated connection referred to, it was necessary to arrange for a longitudinal movement of one of them, which, it is stated, was easily taken care of owing to the small amount of stress which comes on the pin.



Three-Phase Electric Locomotive for the Great Northern Railway—Running Gear

The locomotives are provided with four 400 horsepower three-phase induction motors, one for each pair of driving wheels, which act through a double set of spur gearing, the secondary circuit to each motor being mounted on a shaft carrying a pinion at each end, and the pinions meshing with gear bands which are shrunk onto an extension of the driving wheel centers, the gear ratio being 1 to 4.28. The motors, which are wound for eight poles, when operated at 25 cycles, have a synchronous speed of 375 revolutions per minute, resulting in a speed for the locomotive of about 15½ miles per hour. The voltage at the motors will be 500 volts, which is transformed from 6,600 volts at the trolley. Cast steel is used for the truck frames, which have been made very heavy and substantial.

Notwithstanding the heavy and substantial construction of the locomotives throughout, it was necessary in order to obtain sufficient adhesion to add extra ballast. The two truck frames are interchangeable but have different equalizing systems, the semielliptical springs over the journals on one truck being equalized together on one side of the truck, while in the other truck they are equalized across the truck, the two springs over each axle being equalized together.

The apparatus and controlling devices have been arranged within the cab of the locomotive in as simple a manner as possible. A fireproof compartment located in the center of the cab, and having a wide passageway on all sides, contains the transformers, contactors, blowers, air compressors, etc. The engineer's controller and indicating apparatus are located in the right-hand corner at either end of the cab.

A hydro-electric plant located on the Wenatschee river, about 30 miles from the mouth of the tunnel, furnishes a liberal supply of power, the current being transmitted at 30,000 volts and stepped down by transformers at the mouth of the tunnel to 6,600 volts.

The locomotive is equipped with four trolleys, two being used for operation in either direction, the rail being employed as a third conductor. It is stated that tests of the locomotives have shown them to be capable of exerting three times the guaranteed full load running torque at any speed from a standstill to within a few per cent. of synchronism. The principal dimensions are as follows: Total weight, 230,000 pounds; length over couplers, 44 feet 2 inches; length over cab, 40 feet 1¾ inches; height of cab, 14 feet; width over all, 10 feet; total wheel base, 31 feet 9 inches; rigid wheel base, 11 feet.

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*The Railroad Spike—An Anachronism of the Twentieth Century.**

In spite of the general excellence of the best modern American roadbed and track, with its deep broken-stone ballast, closely spaced ties, and heavy steel rails, it contains one important element, the railroad spike, which is so much out of date, so absurdly inadequate to the work it is expected to do, that it has no legitimate place today outside of a glass case in an American museum of railroad antiquities. The railroad spike was developed at a time in this country when the blacksmith's forge and anvil were more widely distributed and easier of access than the machine shop and the mechanic. The pioneer railroad builder in America built cheaply, not so much because he wished to as that perforce he had to; and when it came to the question of how to fasten the light thirty-pound rail of the early thirties and forties down to the wooden ties it was easily obvious that the quickest and the cheapest way was to *nail* it down; and so a nail or staple, with a hooked head, was forged on the anvil, and nailed down upon the tie with its hook clasping the base of the rail, in the hope that it would hold the two strips of iron in line and to gage, and prevent them from turning over under the lurching of the locomotive and cars.

Although nearly three-quarters of a century have passed, and each decade has seen a steady growth in the weight and speed of railroad trains and in the cost and quality of the tracks which carry them, we are still *nailing* the rails to the ties. Hence we do not hesitate to say that in the whole field of mechanical and civil engineering it would be impossible to find a device which is such an astounding anachronism as that miserable little piece of ⅝-inch-square iron known as the railroad spike, of which it may be truly said that it has absolutely no other qualifications to recommend it beyond that it can be cheaply made and quickly driven into place.

In proof of the above statement let us suppose it were possible that some first-class engineer, of wide experience and what we might call strong mechanical instincts, had never seen a modern railroad, and that for the first time the nature of a railroad were made known to him—the roadbed, track, steel rail and the 200-ton locomotive hauling 60-ton Pullman cars at a speed of sixty to seventy miles an hour, and after the functions of the steel rail, the wooden ties and the ballast had been explained to him, let us suppose that he were asked to design some suitable method of fastening said rails to said ties. After he had carefully studied the nature of the stresses to which the rails would be subjected, both in a vertical and a lateral direction, the pounding, bending, twisting, pulling and pushing stresses, is it conceivable that he would draft out a plan for a little ⅝ or ¾-inch-square spike or overgrown nail with a short hook at the end of it, and offer that as being quite adequate to hold the rail in position? It is safe to say that the spike, as we are using it today, is about the very last form of fastening that would commend itself to him. Rather, he would place his rail upon some form of metallic plate or chair, wedging or bolting it securely thereon; and this fastening itself he would bolt down to the tie, either by some form of heavy lag screw, or by bolts passing entirely through the tie and held by washers below and nuts above.

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*From Scientific American.

The builders of European railroads, taught by experience, realized long ago the absurdity of *nailing* the rails to the track; and for many decades they have been in the habit of either placing the rail in heavy chairs, triple-bolted to the track, or using heavy lag bolts, screwed down until the heads have drawn the base of the rail snugly down upon the tie. The English for many years have used a heavy cast-iron chair, with three or four bolts to the chair. Of late years the best type of American track includes a steel tie-plate, with two or three spike holes, one on the inside and two on the outside of the rail; and this device, apart from the increased bearing surface provided, has the advantage that before the rail can spread it must overcome the resistance of all the spikes that pass through the tie-plates. But, although this is a long step in advance, the spike still remains a poor contrivance, since the vertical springing of the rails under the passing traffic causes the rail base to partially pull the spikes and so decreases the security of the fastening. A combination of heavy lag screws with tie-plates would provide an ideal fastening for the flat-bottomed rail; and we observed, when examining the recent wreck of the White Mountain Express on the New Haven Railroad, that upon the local track adjoining that on which the wreck took place, the company has laid about a mile of experimental track of this character.

The wreck occurred on a track with two spikes to the tie and no tie-plate. The work of resisting the side sway of the locomotives fell upon the single outside spike, which proved, as it needs must, unequal to the task. But had that track been provided with tie-plates and lag screws, it is probable that the spreading would not have occurred. In justice to this road it should be stated that it is now engaged, and has been for some months, in tie-plating all the tracks on which the electric locomotive is used.

It will never be known what proportion of railroad accidents is due directly to the railroad spike. But probably nearly all the derailments that result from spreading of the track may be traced to this cause. We do not know of any feature of the physical characteristics of our railroads that is a more legitimate subject for investigation by such public bodies as the Interstate Commerce Commission and the Public Service Commission than this question of providing a rational means for fastening the rails to the track and holding them in true gage and alignment.

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*How Can the Road Foreman of Engines Interest Engineers and Firemen in Keeping Posted on Progress in Locomotive Developments, Including Valve Gear and Steam Distribution?**

The committee which was appointed by our president to prepare a paper for discussion at our annual meeting on the question: "How can the road foreman of engines interest engineers and firemen in keeping posted on progress in locomotive developments, including valve gear and steam distribution?" sent out a circular letter containing a list of questions pertaining to this subject. While we regret to say that we did not receive as many replies as we had expected, a few of those we did receive were exceptionally good, and from these we have endeavored to make our report.

The first question: "Have you a valve motion model? If so, does it create any interest?"

Judging from the answers received, many roads have such a model, and it has proven to be of great benefit to engineers and firemen—particularly the firemen when preparing for promotion—in explaining to them the action of steam in the cylinders, also the lead, lap, cut-off, admission, exhaust, etc. They readily understand from its use what it would be next to impossible to teach them otherwise.

The model is highly appreciated wherever it is in use, and is considered one of the best features at the enginemen's school of instruction, the locomotive men taking an active interest in familiarizing themselves with it when they have the opportunity.

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*Committee report, Sixteenth Annual Convention of The Traveling Engineers' Association held at Detroit, Mich., August 25, 1908.

One prominent motive power official stated that the valve motion model was so popular with his enginemen that if the company had not furnished one for them they would have purchased one at their own expense.

The second question: "Do you hold class meetings? That is, appoint some certain day to meet with engineers and firemen at the different terminals in your territory?"

The majority of those who replied to this question were in favor of such meetings. There is probably no one thing that would be more profitable to the road foreman, to the men and to the company. Subjects pertaining to the locomotive are discussed, such as break-downs, injectors, lubricators, the different phases of the valve motion and steam distribution, also fuel economy, etc. The men are encouraged to make suggestions, and some very good ideas are usually brought forth.

The third question: "In explaining valve motion and steam distribution, do you use blue-prints? If so, are they satisfactory so far as the engineers and firemen are concerned? That is, do they understand the prints?"

To this question many answered, "No," but do think that colored charts are better understood by the average engineman than blue-prints. Some think blue-prints might be helpful if they are handled by some one who clearly understands them and has the faculty of being able to explain to others in simple language what he knows of the subject.

I have found by personal experience that the average locomotive man finds it difficult to read and fully understand blue-prints.

The fourth and fifth questions: "Have you an old locomotive to which you can take the men so they can see the workings of the valve motion? And do you think it a good plan?"

Some answer, "Yes," but think it very expensive; others say they did not think that many railroads would care to go to such an expense.

The majority favor the valve motion model, as it is much easier to handle and can be taken to the different terminals or wherever instructions are to be given. Equally as good, if not better, results are attained from the model than from the old locomotive.

The sixth question: "Are the men in your territory interested in this subject, and what means do you use to interest them?"

There is no question but that the majority of enginemen would be interested in this subject if they had the opportunity. By explaining to them the importance of keeping posted regarding the developments that are constantly occurring in the locomotive world, they must see for themselves that it is necessary to keep well informed if they wish to succeed in railroad service, although it is usually the men who are about to be promoted who take the most interest.

Among the many suggestions that have been offered along this line was the following: That reading rooms be installed at different terminals where there would be on file copies of technical magazines, papers, etc., pertaining to the locomotive, to which enginemen could have access at all times, for a large amount of useful information is easily obtained from this class of publications.

On the line with which I am associated we have obtained very good results from holding class meetings at the several division points. The men become very much interested, and I find that after they once get an insight into any subject you might bring before them they immediately get "busy" and begin to ask questions. In line with this I might suggest that one of the most important topics and one in which dollars and cents count to the company, is the ever present "economy of fuel" question. It is in the construction of new machinery that will economize in the waste of steam that the modern engine is superior to the older type; so it is in the proper methods of handling the locomotive that the men must acquaint themselves if they expect to get out of an engine all that the designer has put in it.

In conclusion I will say that the road with which I am connected has a valve motion model, and it does create a great deal of interest.

I also hold class meetings at the different division points, posting a notice a few days ahead of the time set for the meeting to notify all concerned. From the oldest engineers to the youngest firemen, all attend, and a deep interest is manifested in the proceedings.

No doubt you have heard of men who are unusually well informed on the locomotive, but who in explaining anything use so many technical phrases that the average man cannot grasp their meaning. It is well to remember that the enginemen, as a rule, do not apply themselves to study. They do not always have the opportunity to do so, and it is well in explaining any part of the locomotive to use simple and plain language, so that each and every one may fully understand. Another point that is well to remember is this: When necessary to discipline a man do so, but when he does anything well give him full credit. Let him know that his good work is appreciated, and it will be an incentive to future improvement.

The committee consisted of W. H. Corbett, chairman; I. C. Hubbell, H. P. Bentley, B. R. Anderson and L. F. Bachman.

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Pointers for Train Dispatchers.

Don't try to send 47 words a minute to an operator whose capacity is 47 words an hour.

* * * It is called the double order system because the orders these days usually have to be sent at least twice.

Don't cuss the conductor. There are 20 or 30 conductors to one train dispatcher, so the feat of even catching up is hopeless.

Some of the most phenomenal runs are made by certain enginemen before they start out. If you wish to be "in" with the denizen of the box seat make him good natured by constantly referring, while in his presence, to the fast time he made the day he had the "caboose bounce." It requires only a slight knowledge of the classic art of prevarication to raise the tonnage from nil to "rating and a half." Every engineman I ever knew made a good run at some stage of his career if it was only getting from the platform to the dispatcher's office to prove that the other fellow caused the delay you were trying to avoid.

Be sociable with the maintenance of way officials and they will do some of the most remarkable stunts in saving track and preventing washouts (especially in dry weather) that you ever heard of. A long suit of this class of effervescence is particularly entertaining if you have on your hands four excursion trains and two wrecks.

When the "lady" operator of Kokomokomo breaks into the middle of an order and whispers "H. Q. B." don't give way to feelings of violence. She means "S. F. B.," and even "lady" operators have to "feed."

Don't put all the movements into one order because, sooner or later, there will come to see you a train dispatcher with a story about where he works; where the train sheet reaches across the street and where 94 orders is the customary allotment on an eight-hour trick. This imaginative liar is less numerous than formerly, but if you fix up all your trains with one grand outburst of train order enthusiasm when you "set in" you will be more likely to disbelieve your loquacious visitor.

Note.—It is possible to send 94 orders on an eight-hour trick—by mail.

If you happen to be a poor dispatcher be sure to smile when the superintendent says it was a bad deal the purple flyer got on your trick three weeks ago next Tuesday. Assure him you have not slept for worrying since it occurred. His heart will kind of warm up to you if you look penitential. If you are a good dispatcher don't tell him to go to the devil—jobs are reasonably scarce.

Don't grog up. There's nothing to it.

Don't harass operators—or others.

A poor operator, as a rule, will sing your charms far and near if you give him a show. It takes poor operators to make good ones.

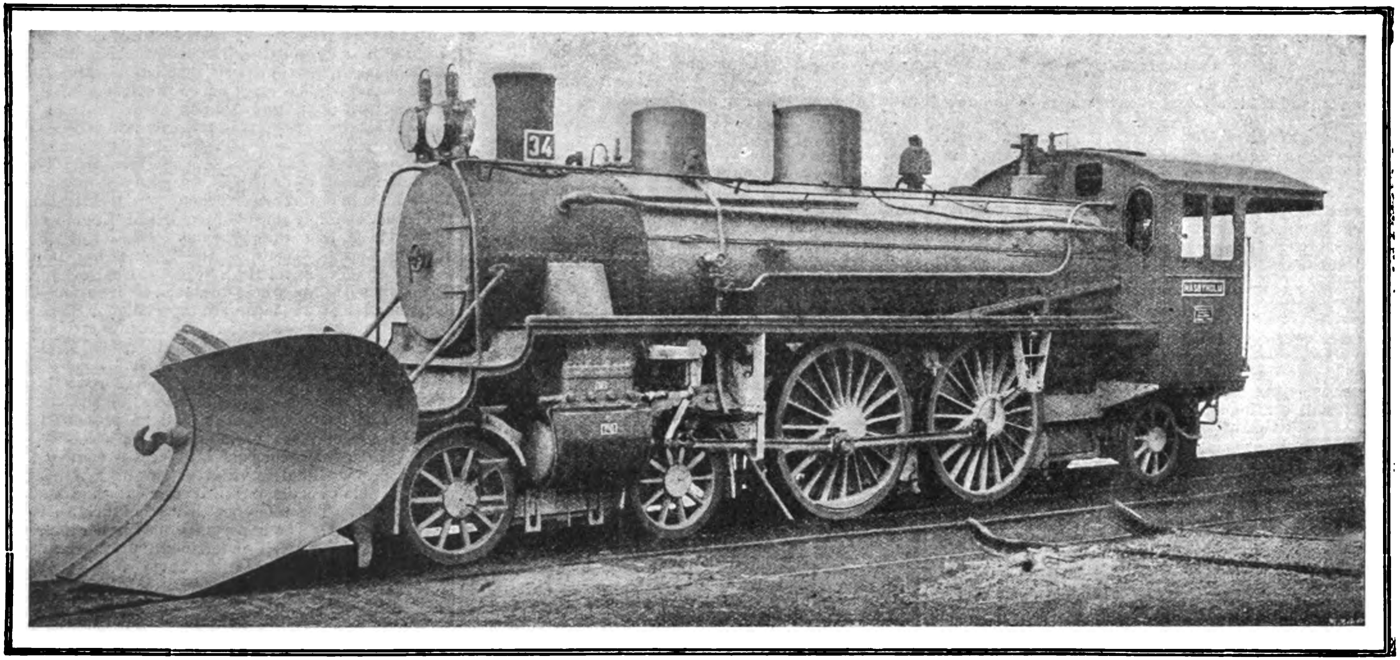
Be resourceful. I once heard of a dispatcher whose division was hopelessly blocked with snow and the only available engine was off the track. He sent a derrick on bobsleds drawn by oxen to the relief of the helpless engine. The road was narrow gauge and small, but the dispatcher was on the job.

If the laws were faultless all the lawyers would starve. By the same reasoning, if the time-tables all were flawless the train dispatcher might suffer the pangs of hunger.

The best way to get on with the trainmaster is to make him think you think he ought to be in charge of the whole division in order to make things go as they ought. (All trainmasters are not like this; only the majority of them.)

Don't turn over to your relief a sloppy transfer. Fix up the trains so they will run at least until he can read the transfer and take a chew.

Adhere strictly to the rules and bulletin



FOUR-CYLINDER COMPOUND LOCOMOTIVE WITH PIELOCK SUPERHEATER AND LENTZ VALVES, MALMO-YSTAD RAILWAY, SWEDEN instructions. (If you wish to be put out of the business permanently.)—Train Dispatchers' Bulletin.

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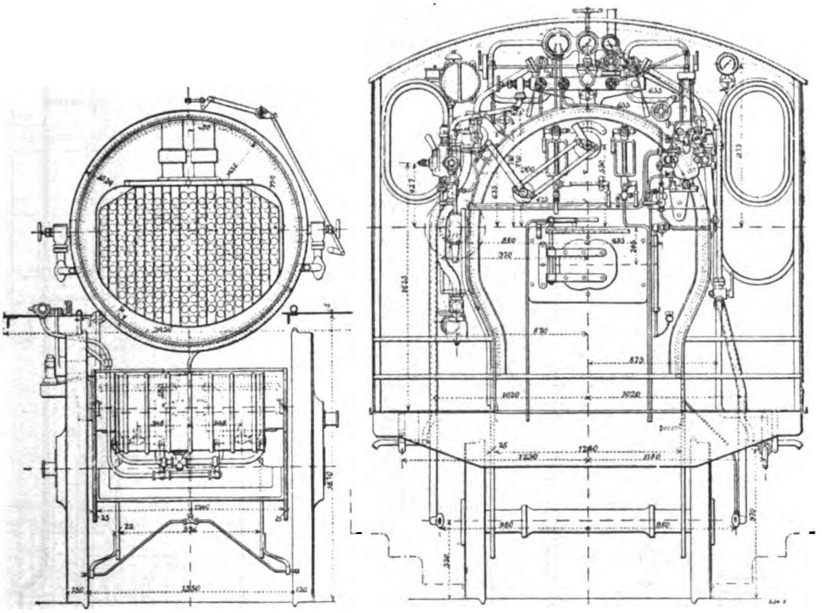
Four-Cylinder Compound Locomotive With Pielock Superheater and Lentz Valves, Malmö-Ystad Railway, Sweden.

Illustrations are shown herewith of one of a number of new locomotives which were designed and built by the Hannoverische Maschinenbau A.-G., Hanover-Linden, for the Malmö-Ystad Railway, in Sweden, under specification by Mr. Dan Olson, chief mechanical engineer, in order that they might be in conformity with the standard practice of that line. This type of engine has been adopted for express traffic, and they embody a number of interesting features. As will be seen, the locomotives have a four-wheel engine truck, two pairs of driving wheels and a single pair of trailing wheels. The engines are four-cylinder compounds, all cylinders driving on to the leading driving axle.

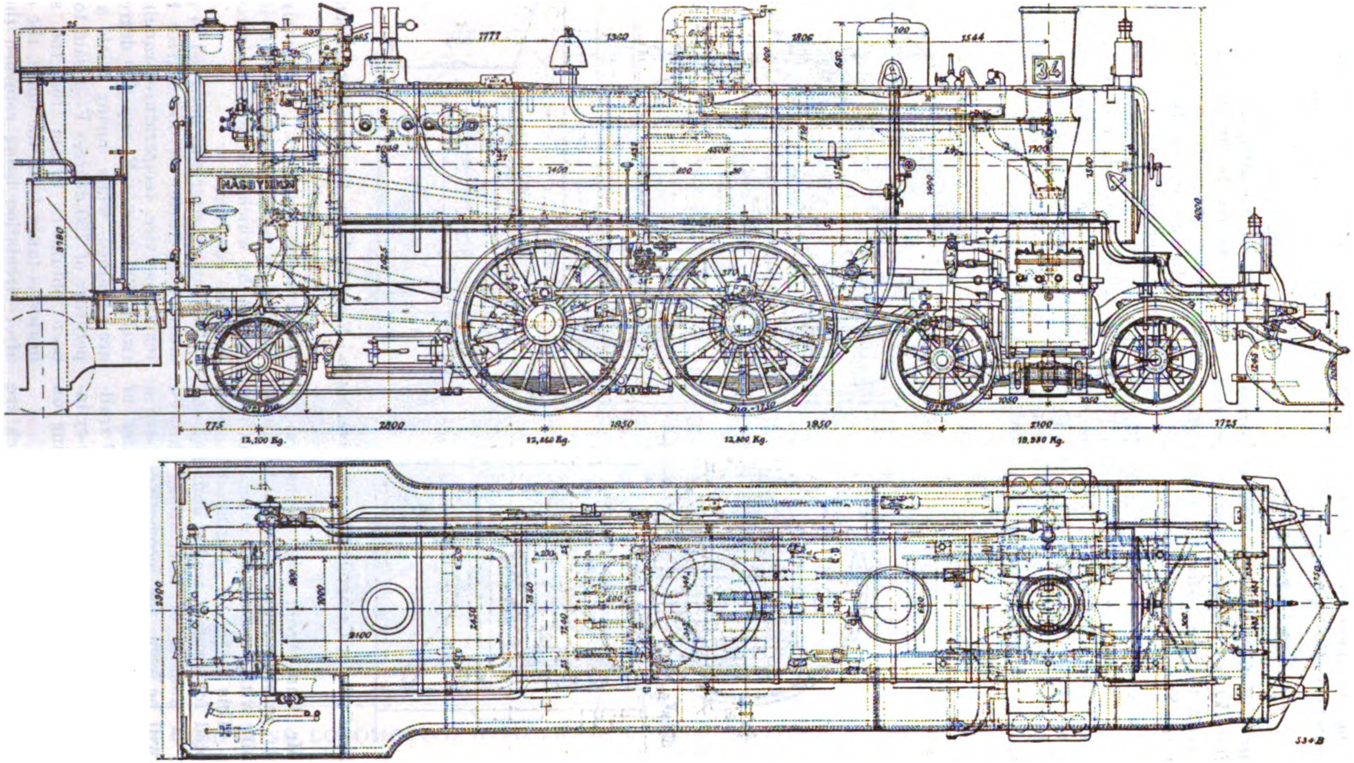
The high-pressure cylinders, which are 13 inches in diameter and have a stroke of 23⅝ inches, are fitted with Lentz valves. It is stated that this system of poppet valves was adopted as a simple solution of the difficulties presented by the use of valves of other design with superheated steam. The low-pressure cylinders, which are 20½ inches in diameter and same stroke as the high-pressure cylinders, have piston valves.

The Heusinger-von Borries type of valve motion, with only one eccentric for each set of high and low-pressure cylinders, is employed, the eccentrics being located on the leading driving axle between the low-pressure cylinder cranks. The valve gear is so arranged that different cut-offs may be given to the high- and low-pressure cylinders. The early von Borries type of starting valve is employed, by which live steam is introduced into the receiver.

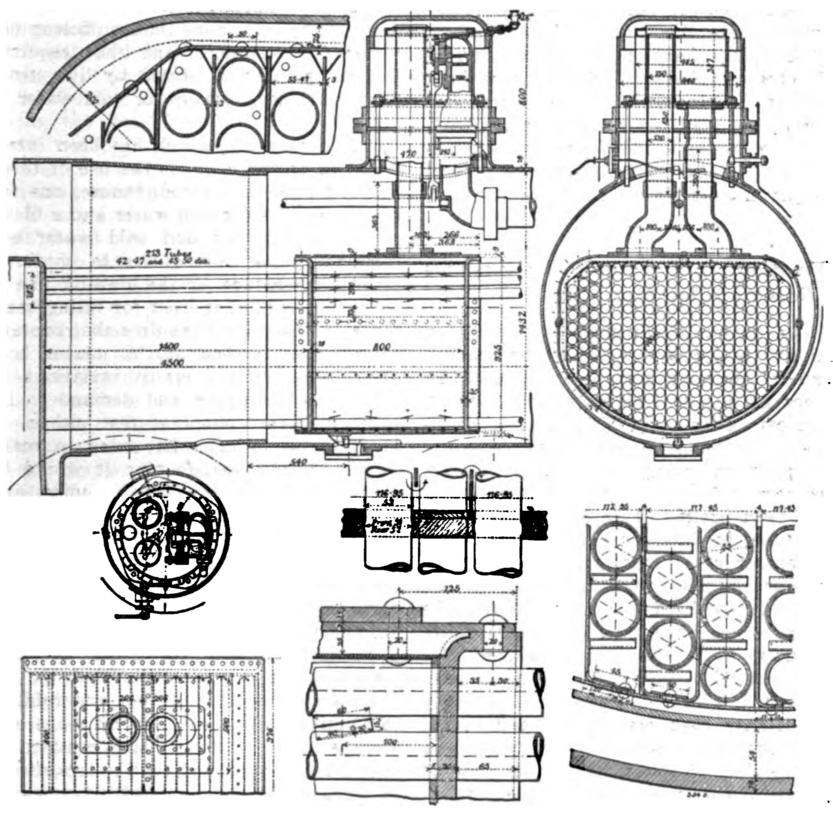


Four-Cylinder Compound Locomotive, Malmö-Ystad Railway, Sweden—Cross-Sections

The superheater was designed to give a steam temperature of 660 degrees F. In regular service, temperatures ranging between 620 degrees F. and 680 degrees F. are obtained, while during trials a temperature of 750 degrees F. is said to have been obtained. Steam for the superheater is taken from the dome, the steam after circulation being returned through the superheater space to a container inside the dome. The superheater sur-



Four-Cylinder Compound Locomotive with Pielock Superheater and Lentz Valves, Malmö-Ystad Railway, Sweden—General Elevation and Plan rounds the whole set of tubes, or flues, and consists of two tube plates and a wrapper plate, the tubes being expanded in the tube plates and reduced in external diameter between the back plate of the superheater and the firebox tube plate for the purpose of facilitating their withdrawal. A number of vertical diaphragm plates are contained within the superheater, these plates being arranged between the rows of tubes, and to which are attached small angles set at a slant. Each alternate vertical plate is clear of the tube plate in order that steam may pass around its end, and are so arranged that this clearance occurs alternately at either end of the superheater. In this way the steam entering one side of the superheater is conducted successively down each passage until it is returned to the dome receiver. The small angles referred to act as deflectors and keep the steam in contact with the hot tubes. Steam is prevented from passing from the inlet pipe to the outlet of the superheater except by the tortuous path prescribed for it by means of a partition placed at the top of the superheater. This design of superheater is considered an improvement over the original Pielock superheater, in which the plates were arranged horizontally, and which is said to have resulted in increasing the temperature of the superheated steam from only 57 per cent. above that of saturated steam (expressed in degrees F.) in the older designs to about 90 per cent. in the new.



Four-Cylinder Compound Locomotive, Malmö-Ystad Railway, Sweden—Details of Pielock Superheater

During the trial tests, on a gradient of 1 per cent., one of these engines hauled a train of 470 tons gross at a speed of 16 miles per hour, and is now running in regular service at a scheduled speed of 50 miles per hour.

The principal dimensions are as follows: Gauge, 4 feet 8½ inches; cylinders, 13 and 20½ x 23⅝ inches; diameter of driving wheels, 69 inches; diameter of engine truck wheels, 40⅜ inches; diameter of trailing wheels, 40⅜ inches; rigid wheel base, 6 feet 4¾ inches; total wheel base, 28 feet 10½ inches; heating surface, tubes, 1,251 square feet; heating surface, firebox, 102.8 square feet; total heating surface of tubes and firebox, 1,353.8 square feet; heating surface of superheater, 373 square feet; grate area, 22.6 square feet; working pressure, 200 pounds; weight on driving wheels, 24 tons 19 cwt.; total weight in working order, 56 tons 3 cwt.

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Washing and Filling Locomotive Boilers With Hot Water.

The theory which explains the sudden failures of locomotive boilers by cracked firebox sheets, broken staybolts and leaky tubes as due to expansion and contraction caused by rapid changes or inequalities in the temperatures is now generally accepted, and abundant proof of its correctness is found in practical experience. The most prolific cause of irregular temperatures in different parts of the boiler is the crude methods employed in washing out and refilling, and while this fact has been realized for many years, the efforts which have been made, until quite recently, to improve this practice have been feeble and futile. The large expense connected with the repairs to fireboxes which have been cracked by cold water; the constant renewal of staybolts and the calking of tubes, as well as loss of service of the locomotive and the requirement of larger numbers of engines for a given amount of traffic, has justified a larger expenditure for the plant and appliances necessary to correct the evil than has usually been appropriated by even the most progressive managements. It has been demonstrated beyond question that the best way to prevent the damage due to irregular temperatures is to wash out and fill the boiler with hot water. Before describing the best modern methods of heating and using hot water for this purpose the general practice in use heretofore may be briefly reviewed:

The injector washout, which has been used to a large extent, is not a satisfactory method, as it involves a constant expense for live steam, it lacks capacity for rapid work, and when heating the water to a proper temperature the delivery has not a sufficient pressure for dislodging scale and mud. Large hot wells or cisterns have been constructed at a heavy expense and the roundhouse piped for blow-off connections to them, but in addition to the loss of heat by conduction and radiation, this method does not supply more than sufficient hot water for washing; and that required for filling must be heated by live steam from stationary boilers, or cold water is used.

Another system which has been introduced in recent years is the use of three lines of pipe in the roundhouse, one for hot water, one for cold water and a blow-off line. The hot and cold water are combined in a mixing box to obtain a given temperature, or the blow-off line is connected with that used for filling some other engine. This requires the constant attention of a man at the mixing box, and there are too many variations in conditions of supply and demand to insure uniform temperatures either in washing or filling. In order to make such a system satisfactory it would be necessary to add tanks and pumps, and the expense would then be nearly as great as that required for one in which the work is done more rapidly and the temperature of the water for both washing and feeding is positively uniform and automatically regulated.

The committee of the Master Mechanics' Association which reported on the "best system of washing out and refilling locomotive boilers by blow-off lines and storage tanks," at the last convention, reached the conclusion that boilers should be washed out and filled with hot water, that the saving obtained by so doing will pay a good interest on the necessary investment, and that the best system is that which will do the work with the least change in the temperature of the boiler, at a minimum expenditure of heat and in the shortest possible time. This brief but sufficient specification can only be met by the new method of washing and filling which is radically different from common practice, and while the discussion of the report indicated that some members thought it necessary to first cool down the boiler before washing, and that the effect of hot water washing was to bake the mud and scale on the sheets, yet the committee, after a careful inspection of the new hot water plants and an investigation of the results obtained, has endorsed the principle of hot water washing without cooling and recommended that it be done as rapidly as possible.

Much of the work that has been done in developing the tank system of hot water washing has been experimental, and the various improvements and refinements which have been worked out are patented and were for a time the subject of patent litigation, so that it is doubtful if a satisfactory system of utilizing the heat from the blow-off steam and water in subsequent washing and filling can now be designed without infringing some of these patents.

Some of the systems which have been put in by the railroads at a large expense do not fully meet the requirements as laid down by the committee, and we can take up the several items in the specifications to see how they were met by a few of the different plants. The definite results from the system which the committee regarded as the best and upon which it evidently based its specifications are as follows: First, as to "the least change in the temperature of the boiler;" while the temperature of the sheets has not been measured it can be assumed that the most uniform temperature of the boiler is obtained by that system in which the temperature of the washout and filling tanks are maintained uniformly.

In a test where the blowing off of steam and hot water from a large boiler occupied thirty-five minutes, the temperature of the filling tank was maintained uniformly at 193 degrees F.; the washout tank varied only from 183 degrees to 193 degrees. In washing out, occupying twenty-two minutes, the temperature of the washout water was kept at a regular temperature of 152 degrees F. The filling of the boiler occupied only 13 minutes and the water in the filling tank did not vary perceptibly from 193 degrees. The record of the performance of the plant, extending over a week, when nearly 100 boilers were washed, showed that these temperatures were regularly maintained, and that it was possible to blow-off two boilers, wash out two and fill two, all at the same time, without causing any material fluctuation in the temperature of either wash or feed water. During this time very little live steam was used, and the maximum saving per boiler over the cold water method was 1,000 pounds of coal and 2,500 gallons of water. This saving results from the utilization of all the blow-off water and steam.

In this system there are two large tanks, one for water used in washing and one for filling boilers, and each is connected to a duplex pump having a capacity of 400 gallons per minute. The roundhouse is piped with overhead lines —one six-inch pipe for blowing off, one four-inch pipe for washing, one four-inch pipe for filling and two one-inch circulating pipes. The total storage capacity in tanks and pipes is 18,000 gallons. At each middle post in the house there are three two-inch down pipes for blow-off, washing out and filling connections to the engines. The tanks have live steam and cold water connections with thermostatic valves which automatically control the temperature of the storage water. The cost of this equipment for a 50-stall roundhouse is about $9,500, but the good results obtained have shown it to be a wise expenditure.

In contrast with the uniform tank temperatures above shown, tests of other tank systems have shown that notwithstanding a large expenditure for tanks, pipes, pumps and regulating valves, the temperature in the wash and feed tanks fluctuates considerably and the desired uniformity is not obtained. For example, it was found that during the day when twelve boilers were blown off and washed, the temperature of the water delivered to the roundhouse for washing was at 8 a. m. 160 degrees F.; at 9 a. m. 120 degrees; at 10 a. m. 70 degrees; at 11 a. m. 110 degrees; and at 12 a. m. 108 degrees. In the afternoon the fluctuation was from 60 degrees to 120 degrees. In a test of a cold water plant, with normal temperature 70 degrees, the thermometer was placed in the back head of the boiler 4 feet above the mud ring, and the observations showed that in blowing off from 110 pounds steam pressure to zero, occupying 30 minutes, the temperature of the water was reduced from 310 degrees F. to 262 degrees; while washing out, occupying 20 minutes, from 235 degrees to 115 degrees; and while filling, occupying 20 minutes, the temperature dropped from 118 degrees to 80 degrees. In firing up the water was heated from 85 degrees to 218 degrees in 30 minutes.

The second requirement in the report of

the Master Mechanics' committee is that the washing out and filling be done with a minimum expenditure of heat, and the chairman estimates that the saving resulting from the use of the best tank system would amount to one-half ton of coal per engine. The third requirement of the specification is that the work should be done in the shortest possible time. This implies that the water and steam should be blown out together, the boiler washed at once and filled with hot water without any interval between operations.

We have seen that by the hot water tank method it is possible to blow off in 35 minutes, wash out in 22 minutes and fill in 13 minutes, a total of 70 minutes. With a boiler filled with hot water it is possible to get up 100 pounds of steam in 25 minutes, so that the minimum delay for the whole wash-out operation is 95 minutes, and, allowing for ordinary delays, the work can be done regularly in two hours. The time required for these operations by ordinary methods is four to six hours, and this saving in time which is accomplished by the hot water system is sufficient in itself in busy seasons to so add to the effective power equipment as to result in a saving of $20,000 interest per year where there is a total equipment of 1,000 locomotives. The direct saving due to the hot water system will average: for coal, $1; water, 15 cents; labor, 30 cents; total, $1.45 per engine. With engines washed out once a week and an equipment of 1,000 locomotives this would be 50,000 wash-outs per year; with a saving of $1.45 each there would be a total saving for the year of $72,500, which, added to $20,000, the saving in interest on the added equipment required by the old system, makes a substantial total of $92,500, which it is estimated can be saved by any large road by the introduction of a good system of hot water washing and filling. All the roundhouses required for the care of 1,000 engines could be equipped with such a system for less than that amount, so that the plants would be paid for in one year out of the saving they produce; and the expenditure is well justified if the results are guaranteed.—Railroad Age Gazette.

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Locomotive Superheating.

Inasmuch as the conditions of operation are very different, it is not proper to compare boilers of locomotives and those of stationary plants. Devices that are successful for large, immovable steam plants may not be valuable in the locomotive, as witness the cross-compound condensing engine with its economies from elaborate attachments. So, in the matter of superheating steam, it would seem proper to approach the matter somewhat differently from the methods pursued in stationary plants. The evidence seems to be all in favor of superheated steam, and the economies are sufficient to demand attention. Because of the fact, however, that the heat of gases passing off from stationary boilers is low, their use for superheaters is very limited, and the added heat usually comes from specially constructed combinations of flues and steam pipes, or else extra furnaces. In either case, the economies result from the better condition of the steam rather than from the utilization of waste heat. In applying superheaters to locomotives, some of the devices follow the "stationary" practice of specially designed flues containing steam pipes. This is objectionable because it reduces the number of flues, and so the heating surface of the already limited boiler, and at the same time adds another complication to flue trouble. Further, there is no saving of the waste heat of the front end. In other designs the superheater is installed in the smokebox so as to utilize the heat that goes to waste here. In the best designs of locomotive boilers the temperature of the front end is frequently 700 degrees or more, and the utilization of this heat is desirable. Even with long flues it is found impossible to absorb all of this heat. The use of superheaters designed to conserve this waste is doubly advantageous and has much to commend it. While it is not possible to get the extreme degree of superheat from this design that is attained in some other, it is doubtful if this is desirable. The majority of locomotives are simple, and the compounds utilize the steam only twice, as compared with three and four times for stationary and marine service. By this method there is no additional expenditure for fuel, and the flue heating surface is left intact. The troubles of lubrication, unequal expansion of cast iron, etc., of highly superheated steam are avoided. Some objection is offered to the smokebox superheater because of the complication of the front end, and this has been augmented by the fact that there have been some failures due to faulty design. Being a new device, naturally some time and thought will be needed to perfect it. This has been true of every improvement. The complication of the front end is largely due to the objection that always comes to doing any work in that part. Being full of cinders and soot, repairmen fight any device that calls for possible work in the smokebox, and condemn it, regardless of its merits. The indicated economies, ranging from 10 per cent. to 20 per cent., are large enough, however, to cover a great deal of possible trouble of inspection, and when to this is added the improvement in locomotive performance, mere aversion to the location should not be considered too seriously. It would seem that the logical location would be the front end, where the waste heat can be utilized.—The Railroad Herald.

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*Fashions in Electric Systems.**

The views presented by an entirely disinterested and impartial critic, Mr. M. E. Uytborck of the Belgian State Railways, in the Bulletin of the International Railway Congress, describing his "Journey of Inquiry" in the United States, form a topic not a little suggestive in the light of other recent publications on the subject of electrical equipment.

Mr. Renshaw, in the December Electrical Journal, points out with admirable clearness and in a manner interesting to others besides the technically trained electrical engineer, the advantages of the monophase alternating current system. The paper of Mr. W. S. Murray, electrical engineer of the New York, New Haven and Hartford Railroad, presented before the American Institute of Electrical Engineers, however much it is to be commended for its frank discussion in the interests of science of the difficulties encountered in the electrification of that railroad, is quite as much a record of failure of the monophase system in its usual application as of the successful overcoming of unexpected difficulties.

The principal advantage of the monophase alternating system is briefly that it permits of the transmission by *two* conductors only—the trolley wire and the track—of those high voltages by which alone considerable economy in the first cost of conductors may be effected, and which are at the same time readily reduced to a safe working tension with almost no loss by means of entirely automatic and comparatively inexpensive static transformers. The design of a method of trolley line construction by means of which the high-voltage wires can be safely secured, of transformers portable on each car and of motors and control apparatus comparable in simplicity to those for direct current, has permitted the introduction of rural and interurban lines using this system, where the agricultural produce and similar freight traffic had to be created and the minimum expense was essential, and where the first cost of conductors, or rotary converter substations and feeders for an equivalent motor voltage, would have entirely prohibited a direct current system.

When the monophase alternating current comes to be applied to the congested terminus of a large railway system, however, these obvious advantages seem to be a little more than offset by practical disadvantages. There is no object in using alternating current except in the readily transformable high voltages desirable for conductor economy; high voltages cannot be safely carried in third-rail or similar conductors, and overhead wires have obvious disadvantages in stations, especially freight stations involving the use of cranes and travelers. The multiplication of switches and side tracks involves a corresponding multiplication of conductors, which, in the case of overhead conductors, is enormously more costly in proportion, taking into consideration the desirability of making the wires from which current is taken as independent as possible and their supports as few as possible, whereas the third rail can be laid anywhere with equal ease and moved or replaced as readily as a length of running rail.

The theoretically automatic monophase transformer is found to provide a flexibility and safety commensurate with that of the direct-current system only with an attendant at every transformer substation; on the New York, New Haven and Hartford system no transformer stations are used, the generating station voltage being carried directly to the trolley, but, whereas on the New York Central electrification only one man to each 6.2 miles is required continuously to attend the rotary converters, on the New York, New Haven and Hartford system there is an attendant in charge of the sectional cut-out corresponding to each

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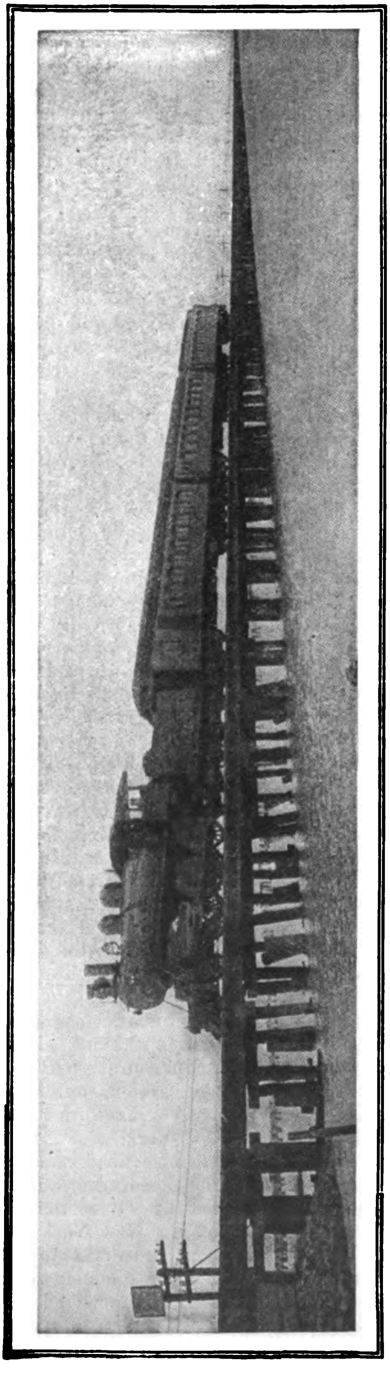
*From Scientific American.



THE GALVESTON, TEXAS, TRESTLE—A FAMILIAR SCENE TO THE DELEGATES AT THE FIFTH BIENNIAL (1896) CONVENTION

switch-bridge *every two miles.* In either case the duties of the employe permit him to attend to other matters, so that the only difference in cost favoring the monophase system is that of the buildings required and the moving machinery of the direct-current converter stations, which rather effectually disposes of the theory that on monophase railways no staff is required for the distribution of traction current.

The number of employes of course decreases with the track congestion, and many miles of monophase trunk line would require only one sectional cut-out attendant, whereas a direct-current trunk line would still require the converter station and attendant every six miles or so; to offset this, however, there is the immediate probability of the development for large power work of static transformers from alternating to direct current, and their introduction would at once put the direct current upon the same plane as the alternating as regards automatic transmission.

To come to the economy of operation, a New York Central train weighing, say, 175 tons, with an engine weighing 95, requires in starting from stations and in shunting operations only 400 to 500 amperes at 600 volts; a corresponding New Haven train in getting up speed requires 2,000 amperes and upward at the same voltage, or approximately five times the power, making no allowance for phase displacement, and the motors have the additional disadvantage that running at low speed can only be effected by repeated cutting off and on of the current.

In view of the above considerations, the difficulties of adequately insulating high tension overhead wires in smoky tunnels, of stray magnetic fields, lack of inductive element to counteract surging currents, and not least the electrical possibilities of a serious accident within the electrified zone, which are far more appalling for high-voltage overhead conductors than for any third-rail system under lower voltage, Mr. Uytborck concludes that traffic conditions should be the principal determining factor in deciding upon the system to be used. Electrical engineers, he suggests, have the tendency to follow the latest fashion and to adopt that which is new and has been successful in some instances in preference to older and better known methods that could sometimes be more economically used.

Electrification of the St. Clair Tunnel.

In 1890 the St. Clair Tunnel Company, organized as a subsidiary to the Grand Trunk Railway Company, completed their submarine tunnel under the St. Clair river between Port Huron, Mich., and Sarnia, Ont. Previous to the construction of the tunnel the Grand Trunk maintained connections between Sarnia and Port Huron by means of a ferry, the cars being carried across the St. Clair river on the deck of ferry boats specially built for that purpose.

This method was adopted for the want of a better one, although the service grew less satisfactory as the traffic of the road increased. Though the swift current, where Lake Huron pours its entire volume through a narrow outlet, prevents the river freezing in winter at the point where the boats crossed, still, ice blocks occasionally occurred, and a single day's interruption to traffic involved serious inconvenience and loss. A bridge had often been suggested, but it was always successfully opposed by the vessel owners. A larger number of vessels, with a greater tonnage, pass up and down the St. Clair river during the season of navigation than through the Suez canal in a year.

The tunnel when completed in 1890 was considered one of the greatest engineering achievements of its day. It is a single track iron lined tube nineteen feet in diameter and 6,032 feet long. The open tunnel approaches are about 5,800 feet in length, that on the Port Huron side being slightly over 2,500 feet in length, while that on the Sarnia side is nearly 3,300 feet in length, the total distance between the United States and Canadian summits being 12,000 feet, or about 2¼ miles. The tunnel approaches and its inclined sections are 2 per cent. grade, while a middle section of about 1,700 feet in length has only sufficient incline—one-tenth of 1 per cent. being given toward the Canadian side—to provide for drainage.

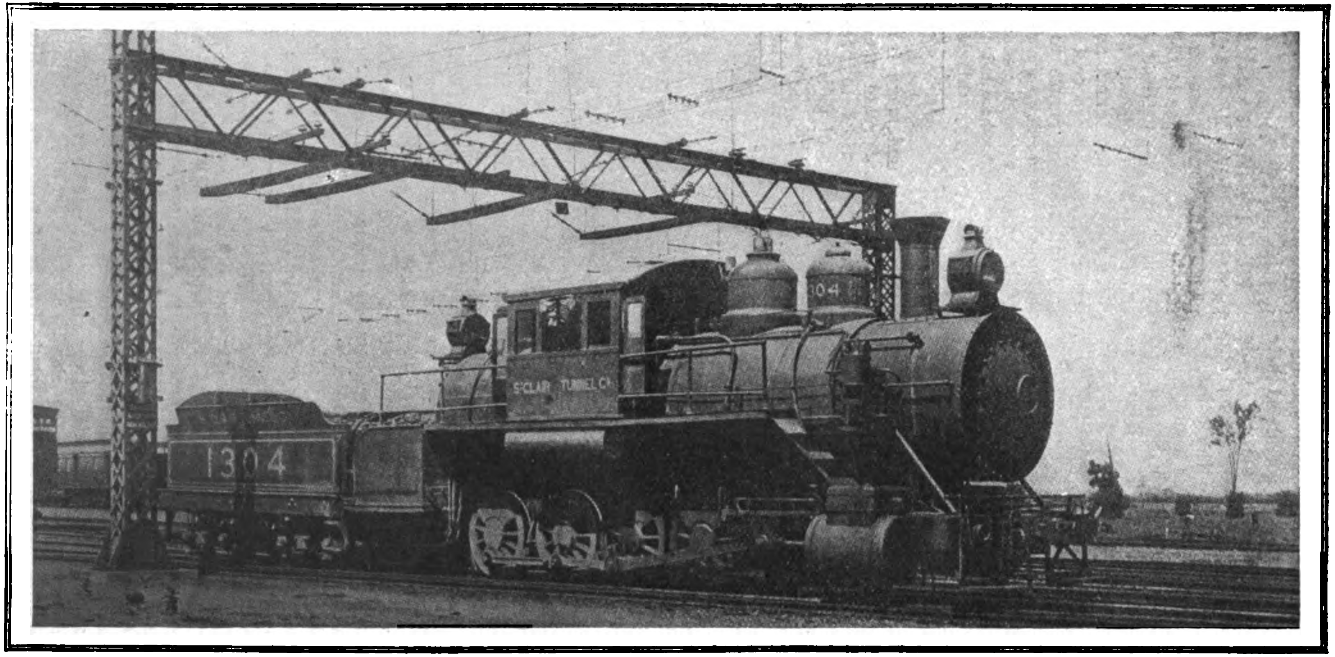
While a single track extends through the tunnel, a double track is laid in both of the tunnel approaches. The disposal of the rainfall on the tunnel approaches is a problem that required special attention. The combined areas of the Port Huron and Sarnia approaches are about 24 acres. The rainfall on these approaches is discharged into waste ditches on the bank above by means of pumps of large capacity. This pumping service is of great importance in the operation of the tunnel because if the tunnel becomes flooded with water it would entirely interrupt the traffic.

When the tunnel was completed four steam locomotives of special design were placed in commission to handle the freight and passenger traffic. They were provided with the necessary high tractive effort required to operate the trains over the grades in the tunnel and on the approaches. Anthracite coal was used for fuel in order to reduce to a minimum the inconvenience due to excessive smoke. Their maximum tractive effort limited the weight of trains handled to about 700 tons, and even with this load the speed up the 2 per cent. grade was often very slow.

The smoke and gases from the steam locomotives constituted not only an element of discomfort to passengers, but also an element of danger in the operation of the trains. The suffocating air threatened asphyxiation whenever a train was stalled in the tunnel, and the obscuring of the signals jeopardized the safety of travel. It was dangerous with the steam locomotive to operate the air brakes on freight trains through the tunnel, because in the event of a bursted hose or the train breaking in two, the time necessary to replace the bursted hose or to recouple the sections and release the brakes exceeded the time within which the locomotive could be kept in the tunnel without causing suffocation to the crew. The speed of the freight trains down the approaches was controlled by the air brake on the locomotive and hand brakes on the freight cars, while with the electric locomotives recently installed the air brakes can be operated on the entire train, and in case the brakes are applied from any cause the locomotive can remain in the tunnel as long as required to repair the defect.

The elimination of smoke from the tunnel will add greatly to the personal comfort of passengers and the appearance of the passenger coaches and engines.

With the constantly increasing traffic, at times the capacity of the tunnel with the steam locomotives was taxed in handling the tonnage delivered to the tunnel company by the two divisions of the Grand Trunk Railway System, and it was deemed advisable to change the motive power to electricity, which eliminated the danger and inconvenience due



TYPE OF STEAM LOCOMOTIVES FORMERLY USED IN HAULING TRAFFIC THROUGH ST. CLAIR TUNNEL to the obnoxious gases from the steam locomotives in the tunnel.

The St. Clair Tunnel Company is operated as an independent division of the Grand Trunk Railway. The east-bound trains are delivered in the yards at Port Huron and taken by the tunnel locomotives through the tunnel and to the yards at Sarnia. The west-bound trains are handled in the reverse order. The road or yard engines are never operated through the tunnel.

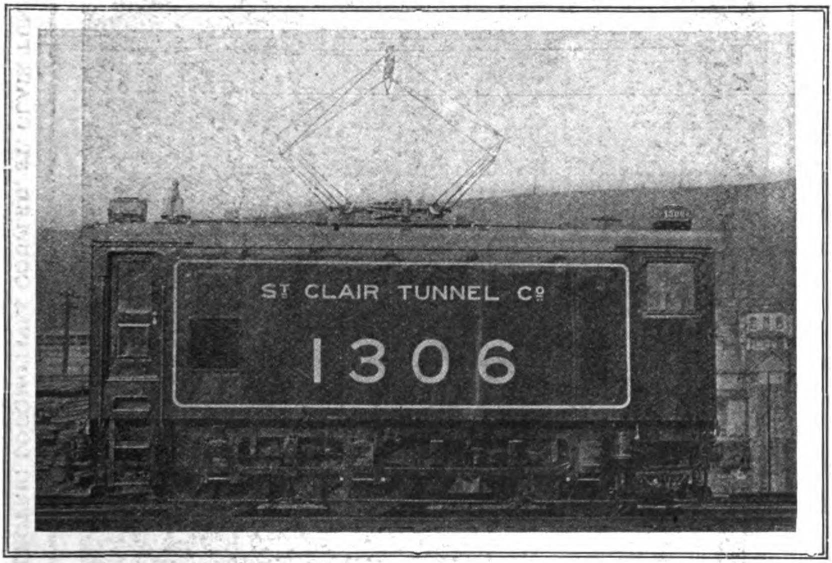
In order to increase the capacity of the tunnel it was necessary to provide for the maximum practicable tractive effort in the new locomotives, and their capacity limit was determined by the maximum pull it was considered safe to subject the drawbars to on the mixed rolling stock that was to be handled without breaking trains in two. The locomotives were designed of sufficient capacity to develop a drawbar pull of 50,000 pounds when operating at a speed of ten miles per hour. It was determined that a locomotive of such capacity would be able to make a trip through the tunnel from terminal to terminal with a 1,000-ton train in fifteen minutes, or four 1,000-ton trains per hour. This would provide a capacity for traffic about three times larger than the actual maximum demands up to the present time.

The pumping service required the installation at the Sarnia portal of two pumps with a combined capacity of 11,000 gallons per minute, and at the Port Huron portal the installation of two pumps, each with a capacity of 4,000 gallons per minute.

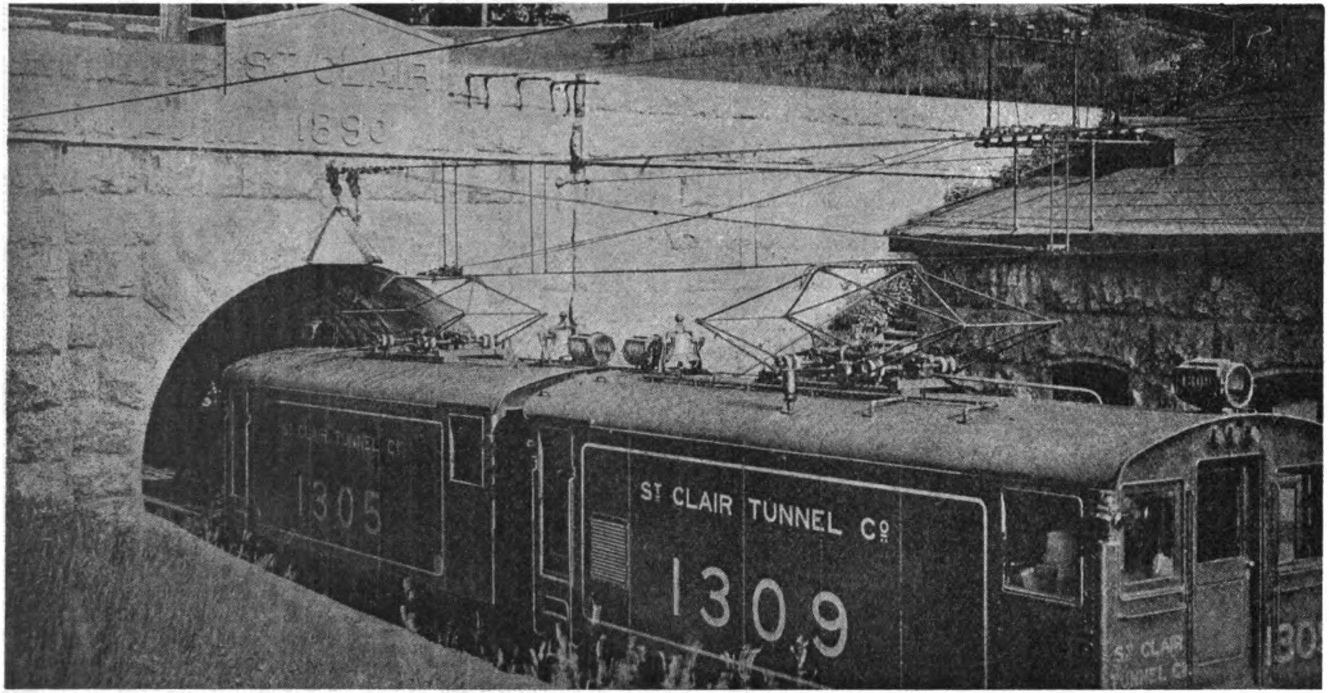
In order to provide absolute continuous service, duplicate pumping equipments were provided in each portal, as well as duplicate feeder lines leading from the power plant to the pump houses. Power for motors in the roundhouses at Port Huron and Sarnia as well as lighting service was also provided for in the new plant.

To furnish electrical energy for the entire service outlined above, provision was made in the power plant for supplying single-phase current for the electrical locomotives, three-phase current for the pumping service, and three-phase and single-phase current both for the power and lighting service at various points throughout Port Huron and Sarnia, as well as for a small amount of arc lighting.

The contract was awarded to the Westinghouse Electric and Manufacturing Company, who were responsible for the proper installation and successful operation of the entire equipment. Since May 17, 1908, the entire train service of the St. Clair Tunnel Company has been han-



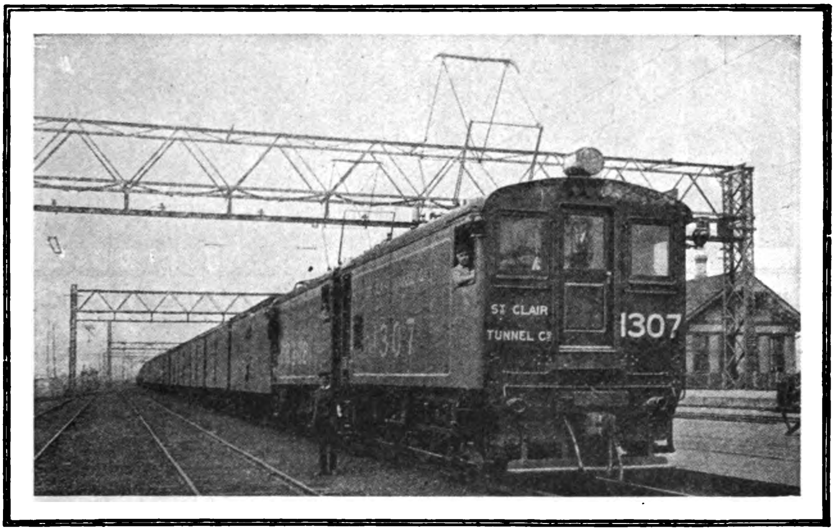
ELECTRIC LOCOMOTIVE, ST. CLAIR TUNNEL



TWO ELECTRIC LOCOMOTIVES COUPLED, ST. CLAIR TUNNEL dled by the new equipment, this being the heaviest railroad service handled by electricity in the world.

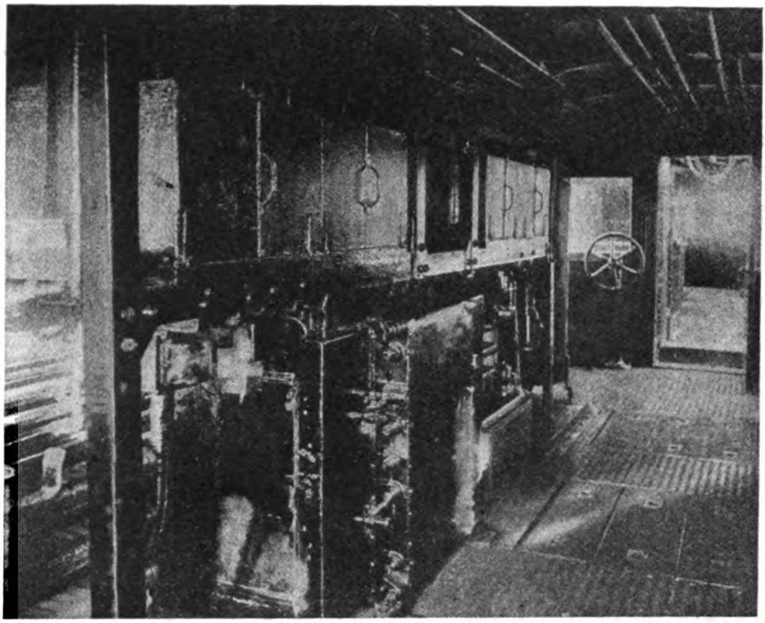
Three locomotives, each consisting of two half-units, each half-unit mounted on three pairs of wheels driven through gears by three single-phase motors with a nominal rating of 250 horsepower each, the nominal horsepower of the complete locomotive unit being 1,500, have been provided for this service. The electric motors have a very liberal overload rating, and it is easily possible to develop 2,000 horsepower, and on occasion in excess of this, in one locomotive. The half-units are duplicates in every respect, and as the multiple unit system of control is used, they can be operated when coupled together with the same facility that a single-phase half-unit can be operated. The locomotives are designed to develop a drawbar pull of 50,000 pounds at the comparatively low speed of ten miles per hour, and are powerful enough to start a 1,000-ton train on a 2 per cent. grade in case this should become necessary. A dynamometer car test was made with a half-unit and it was found that a single half-unit developed 43,000 pounds drawbar pull before slipping the wheels. This was done on a comparatively dry rail, with a liberal amount of sand used. On this basis it would be possible to develop about 86,000 pounds drawbar pull with a complete locomotive. The maximum speed of the locomotives is thirty-five miles per hour.

The tunnel company does not intend, however, to operate the locomotives at a speed in excess of thirty miles per hour. Speed indicators are provided in the locomotive cab near the engineer's seat which indicate on a large dial the speed at which the locomotive is running, and at the same time records the speed throughout the length of the run. This assists the engineers in keeping the speed of the trains within the prescribed limits at all times, and furnishes records of the exact speed of the trains throughout all trips for the inspection of the superintendent of the tunnel.

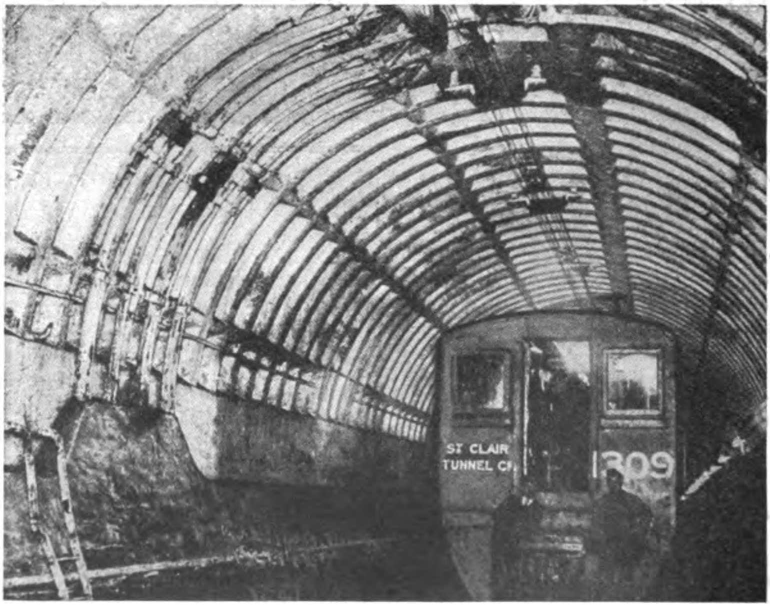


HEAVY FREIGHT TRAIN HAULED BY TWO ELECTRIC LOCOMOTIVES, ST. CLAIR TUNNEL ELECTRIFICATION

The cab of the locomotive is rectangular in section, constructed of sheet metal and supported by structural steel shapes. Practically all of the apparatus used in connection with the locomotive, with the exception of the motors and the brake rigging, is located inside of the cab. A single-phase transformer used for reducing the voltage from 3,300 to a voltage suitable for application to the motor is located inside the cab. The transformer as well as the motors are air-cooled, the supply of air being furnished by an electrically driven blower, which is also



INTERIOR OF CAB OF ELECTRIC LOCOMOTIVE, ST. CLAIR TUNNEL



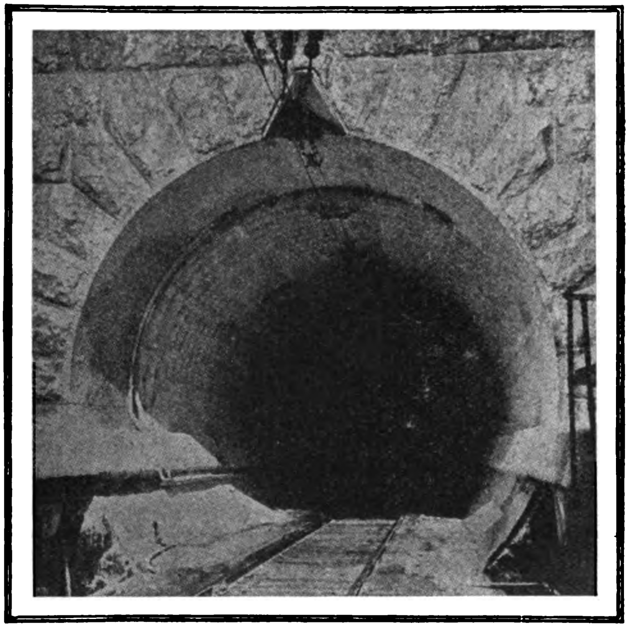
INTERIOR OF ST. CLAIR TUNNEL

located in the locomotive cab. The blower is driven by a single-phase motor, the current being supplied at 100 volts by a tap from the main transformer. The transformers and motors are able to operate at full capacity with comparatively little increase in temperature above that of the surrounding air, owing to the moderate supply of cooling air furnished by the cooling fan. The cooling air is taken through a shutter located in the side of the locomotive cab, and is distributed through sheet metal ducts installed under the cab floor to the three motors under the cab, and to the transformer. From the latter the air passes either through an opening in the floor of the cab into the open air, or if desired, into the interior of the cab. When the air is turned into the cab an appreciable amount of heat is secured from the main transformer to heat the cab during cold weather.

Motor-driven air compressors are also located in the cab to furnish compressed air for the locomotive and train brakes, as well as for operating all of the contractor switches used in controlling the operation of the locomotive, bell ringer, air whistle, air sander and for raising and lowering the trolley. The air brake equipment is of the ET type, the same as used on steam locomotives.

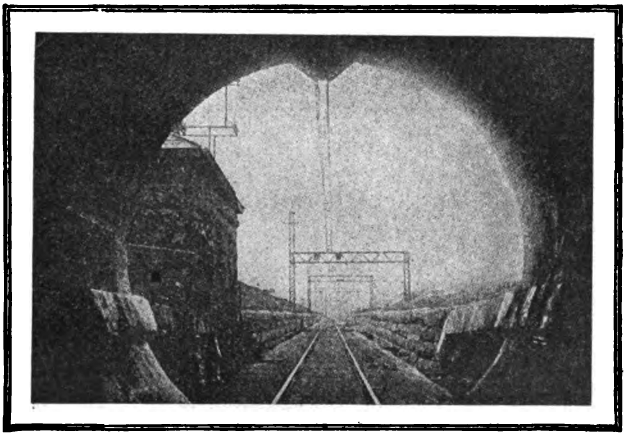
Speed control of the locomotive is effected by varying the voltage at the terminals of the motors. This is obtained by making connection with various transformer taps by means of the air-operated, electrically controlled contactor switches.

Electric control of the contactors is effected through the master controller. The current for the master controller is furnished by a small storage battery operating at about 20 volts, the battery in turn being charged by means of a small motor-generator set provided for the purpose. The electric controller has twenty-one points in all, seventeen of which are running points. This provides for an increase in the speed of the locomotive from the lowest running speed to the maximum speed by very slight gradations, thus making it possible to maintain a practically constant drawbar pull while the locomotive is accelerating the train. This is especially desirable inasmuch as the minimum variation in the drawbar pull while handling the train



SHOWING TREATMENT OF TROLLEY SUPPORTS AT ENTRANCE, ST. CLAIR TUNNEL through the tunnel decreases the liability of breaking the train in two. Owing to the fact that in designing the locomotives particular attention was given this phase of train operation, a remarkable decrease in the number of break-in-twos has been noted since inauguration of the electric locomotives.

On the master controller is also located the reverse lever, which controls through the electrically-operated solenoids the air-operated contactors used in reversing the motor connections. Push buttons, which serve to raise and lower the trolley, operate the front and rear sanders, reset the circuit breaker, and ring the bell are also located on the master controller.



VIEW FROM PORTAL, ST. CLAIR TUNNEL

The bell ringer and automatic sanders are also controlled by foot pedals, thus enabling the engineer to operate these devices while his two hands are employed in operating the master controller and the engineer's brake valves. The sand boxes, the engineer and assistant's seats, ammeters, voltmeters, wattmeters, the banks of contactors, the preventive resistance coils, circuit-breakers, auxiliary storage battery and motor-generator set for charging it are all installed in a compact manner inside of the cab and are supported on structural steel work.

Each half-unit is arranged for operation in either direction, and engineer's brake valves, master controller and ammeter are located at each end of the cab. Two or more half-units can be operated together by means of cable couplings from any master controller. Two half-units are generally used in the handling of freight trains through the tunnel. The passenger traffic can ordinarily be taken care of by a single half-unit. The trolley wires are suspended 22 feet from the track and the current is collected from the wires by means of a sliding bow pantagraph trolley. The trolley wire extends through the length of the tunnel, so no additional provision has to be made for the collection of current while the locomotive is passing through the tunnel.

The locomotives are equipped with electric headlights, as well as lights for the illumination of the interior of the cab and the dials of the indicating instruments. The cabs are heated by means of standard electric heaters. Heat is also available for drying the sand in the sand boxes. The M. C. B. standards have been conformed with in respect to couplers, wheel treads, etc.

The general dimensions of the half-units are as follows:

Length over all, 23 feet 6 inches.

Height from top of rail to top of roof, 13 feet.

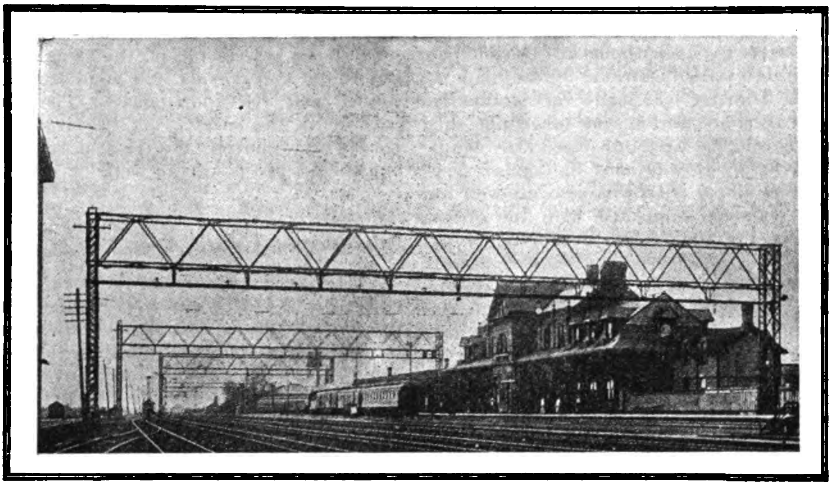
Height from top of rail to top of pantagraph bow when lowered, 14 feet 11 inches.

Width of cab over all, 9 feet 8 inches.

Total weight of locomotive half-unit fully equipped, 67½ tons. (This weight is practically evenly divided over three drivers).

Weight of complete locomotive unit, 135 tons.

Length of rigid wheel base, 16 feet.



OVERHEAD CONSTRUCTION AT PORT HURON STATION, ST. CLAIR TUNNEL ELECTRIFICATION

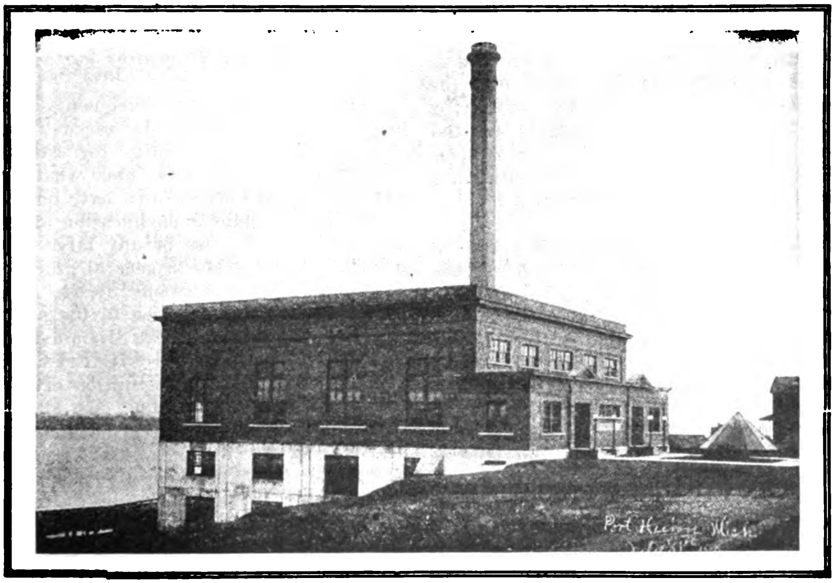
Diameter of driving wheels, 62 inches.

Normal speed of train, ascending 2 per cent. grade, 10 miles per hour.

Normal speed on level track, 25 to 30 miles per hour.

These locomotives will very readily handle a 1,000-ton train at from eleven to twelve and possibly thirteen to fourteen miles per hour on a 2 per cent. grade.

The construction of this plant and transferring the operation from steam to electricity was done without any material interference with the traffic through the tunnel. The greatest difficulty was experienced in doing the necessary work in the tunnel proper. The tunnel was given over to the contractor for construction purposes for two-hour periods each day during the time that actual construction was



POWER PLANT AT PORT HURON, MICH., ST. CLAIR TUNNEL ELECTRIFICATION in progress in the tunnel. The construction of the overhead work in the yards was carried out without any serious interference with the traffic of the road.

The transfer was made very gradually, and every precaution was taken not only to thoroughly test all electrical equipment before it was used in regular service, but ample time was also allowed for all who were connected with the operation of the equipment to thoroughly familiarize themselves with every detail of their work. The steam locomotive engineers and firemen were trained in the use of the electric locomotives. The men required for maintenance and operation of the power plant were instructed and assigned their duties during the time the first experimental and test runs were made with the equipment.

When everything was completed test runs were made with light locomotives through the tunnel, and the tonnage was gradually increased until finally the regular trains were handled by the electric locomotives. No delays worthy of notice were incurred during the transfer.

Substantial steel towers have been erected throughout the tunnel yards at Port Huron and Sarnia for the distribution of the single-phase current to the locomotives. The steel work used for supporting the working conductor consists of strong lattice columns supporting bridges of trussed construction. The average spacing of the overhead bridges is 250 feet. They are designed to extend over all tracks that are to be electrified, and at passenger stations extend over the platforms, thus in no way interfering with the access of passengers to and from the trains. At Port Huron some of the bridges span seven electrified tracks in addition to the station platform.

Dispatching.—The tunnel is protected by a block signal system which extends from summit to summit. The dispatcher's cabin is located at the Sarnia summit and the other signal cabin at the Port Huron summit. Telegraph orders are used, and in addition to the written order the conductor receives a staff when the train enters the block. The switches and signals are locked until this staff is placed in the instrument at the other end of the block. This method of protecting the trains in the tunnel is so complete that not a single accident chargeable to dispatching has occurred during the 18 years of tunnel service.

There is a yard telephone system, and in addition a special telephone line connecting the power station, the signal cabins at the two portals, the middle of the tunnel and the roundhouse. The dispatcher is the master of the situation. He not only controls the train movements but the motive power as well.

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*Locomotive Grate Area.**

The relative advantage of large and small grates for locomotive boilers has not been definitely settled by any accurately measured tests, and there is still opportunity for the profitable investigation of this question. The Pennsylvania Railroad tests at St. Louis covered such a large field that there was not time during the exposition to deal with the effect of different grate areas in the same locomotive. Since the testing plant was moved to Altoona some experimental work has been done in this line of investigation, with one of the standard P. R. R. simple Atlantic locomotives, having cylinders 20½ inches by 26 inches and 80-inch wheels. Three series of tests were run: (1) with full grate having an area of 55.5 square feet; (2) with the front grate covered with fire brick so that the effective grate area was reduced to 39.5 square feet, the ratio of grate area to heating surface being 1 to 58.7; (3) with the effective grate still further reduced to 29.76 square feet, giving a ratio of grate area to heating surface of 1 to 77.9.

Tests of this kind have frequently been made with locomotives in service, but there was not opportunity for careful measurement of results, and whatever conclusions have been drawn have not resulted in a permanent modification of the grate area or the use of any large proportion of dead grate in general practice. The important conclusions drawn from the Altoona tests are given in the paper on "Combustion and Heat Balances in Locomotives," by Lawford H. Fry, read at the meeting of the Institution of Mechanical Engineers, London, last March. It was found that if any given quantity of coal, as, for instance, 4,000 pounds, is fired per hour, the efficiency of absorption of heat is independent of the grate area, being practically the same whether the coal is burned on the full grate of 55.5 square feet at 72 pounds per square foot or on the smaller grate having an area of 29.76 square feet at the rate of 134 pounds per square foot per hour.

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*From Railroad Age Gazette.

The explanation given is that in the tests with the three different grate areas, the firebox volume is a controlling factor in combustion and is constant; so that a given quantity of coal has in all three tests practically the same opportunity of complete combustion, irrespective of the rate at which it is fired per square foot of grate.

The efficiency of the absorption of heat actually produced was found practically independent of the rates of combustion and evaporation, varying only from 78.4 to 79.7 per cent. That is, under all conditions of the Altoona tests the boiler absorbed about 79 per cent. of the heat produced by combustion, while the boilers in the St. Louis test showed a constant efficiency of absorption of about 81 per cent.

The efficiency of the boiler as a whole is mainly determined by the efficiency of combustion, which falls rapidly as the rate of combustion is increased. The rates of firing in the Altoona tests ranged from 2,000 to 5,000 pounds of coal per hour, and the chief items affected by an increase in the rate of firing are as follows: The loss of CO increased from 0.4 to 2.4 per cent. The loss of heat in the gaseous products of combustion decreased from about 18 per cent. to 15 per cent. The loss by unburned coal increased from 10 per cent. to 28 per cent. The boiler efficiency as a whole decreased from about 68 per cent. to 52 per cent. The highest rate of evaporation obtained was 18.6 pounds of water per square foot of heating surface per hour with a boiler efficiency of about 51 per cent. At high rates of evaporation the largest grate gave the highest efficiency. This is due to the fact that the resistance to the passage of air through the grate is least with the large grate and largest with the small grate. At low rates of combustion the most important losses are those due to an excess of air; consequently, the large grate has then the lowest efficiency.

At the high rates of combustion the most important losses are those due to coal escaping unburned from a lack of sufficient air for proper combustion; hence the largest grate by admitting the air most freely gives the highest efficiency. The spark losses are less also on account of the milder blast required by the large grate.

The Altoona tests were made with a constant firebox volume and variable grate area, and it would seem desirable to supplement them with tests of fireboxes having the same length as the grate so that the ratio of grate area to firebox volume in each case would be the same, thus giving the condition of a normal boiler. This ratio is an important one, and it is surprising that it has been so little used in the discussion of combustion in locomotive boilers and of boiler and firebox proportions; especially in relation to the effect of large combustion chambers.

It is important to distinguish between the efficiency of absorption of heat produced and the efficiency of combustion, the former being nearly constant, as stated above, for locomotive boilers having a wide variation in size and in the proportion of heating surface to grate area. In the St. Louis tests the ratio of heating surface to grate surface varied from 50 to 75 in four boilers whose efficiency of absorption did not vary 1 per cent. This would indicate that the arbitrary factors which have been used to determine proper grate area from its relation to heating surface are not so important, and this area should be arrived at by other considerations. The Pennsylvania locomotives have a smaller proportion of tube heating surface than is usually found in American practice, but their efficiency in absorbing heat is the same as that of boilers having larger tube surface with relation to grate area.

The efficiency of combustion, however, has an important relation to grate area and firebox volume, and it decreases rapidly as the rate of combustion increases, thus affecting the boiler efficiency as a whole. For the combustion of a given amount of coal this rate increases as the area of the grate decreases; hence boiler efficiency is materially affected by grate proportions. In the Altoona tests the smallest grate, one with an area of about 30 square feet and burning 5,000 pounds of coal per hour, or 166 pounds per square foot of grate, showed a loss from unburned coal, principally sparks, of 29 per cent. of the coal fired, with a boiler efficiency of 52.9. This large spark loss is due to the heavy blast required to burn coal at the rate given, the smokebox vacuum being about 6 inches. The spark loss can be largely reduced by increasing the grate area.

In the past ten years the width of locomotive grates for bituminous coal has been increased from 40 inches to as high as 80 inches, and the area from 30 square feet to 62 square feet, and in this way the rate of combustion has been kept down to 100 pounds per square foot of grate per hour, and the spark loss to 12 to 15 per cent.

Grate area should have some relation to the quality of the coal, poor coal requiring a larger area for the production of a given amount of steam. Western coals contain a large percentage of sulphur in combination with iron as pyrites. The pyrites and ash fuse together and form a thin layer of solid clinker which effectively stops the passage of air through the grate, thereby permitting the grate bars to become overheated from the hot fuel above. The clinker then melts down into the spaces between the bars and the sulphur combines with the iron of the grate. In this way the grates are warped and destroyed in a short time. The repairs to a large grate are made at a heavy expense and the engine is kept too long out of service. Such experience, together with leaky tubes and other troubles connected with large fireboxes, have in some instances led to the return to smaller grates. Thus in 1905 the Chicago, Milwaukee & St. Paul built a large Pacific type locomotive with cylinders 23 inches by 26 inches, 72-inch wheels, a firebox 41⅛ inches wide and a grate area of 35.8 square feet. The rate of combustion on the two-hour passenger run from Milwaukee to Chicago was 200 pounds per square foot of grate per hour. A more recent case is that of the new Pacific type locomotive built by the Baldwin works for the Alton. The Pacific locomotives built for this road in 1904 had cylinders 22 inches by 28 inches, firebox 66 inches wide and a grate area of 49.5 square feet. The five engines recently built have cylinders 23 inches by 28 inches, 73-inch wheels and narrow fireboxes. The grate is 40¼ inches wide and 10 feet long, and the grate area only 33 square feet. The rate of coal consumption required for such large cylinders will be very high, probably over 200 pounds per square foot, and the spark loss will be excessive. The return to the narrow grate is therefore at the expense of coal economy, but is necessary in order to avoid the troubles from pyrites in coal and from leaky tubes attending the use of the large grate. Where the coal permits of the large grate being maintained at ordinary expense it is the most economical and should be of such an area that the rate of combustion shall seldom exceed 100 pounds per square foot per hour.

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A Reasonable View of the Ashpan Law.

In commenting upon the passage by Congress at near the close of its last session of a law requiring railroads to equip their locomotives with ashpans that can be cleaned without the necessity of firemen going underneath the engines, the Railroad Herald says:

"There can be no question that the law will add to the safety of the firemen and hostlers, and for this reason it should properly have been passed. Although some roads, in objecting, stated that it was impossible to apply the devices necessary, it is hard to see why not. There is a year to properly work out the details, and the problem does not present impossible features. Several devices of this nature have been tried out in the past and some are in operation. The greatest objection has been caused by the dumping of fires on trestles and the danger of fire from this cause. This is a matter of discipline that can be regulated. It is possible, also, to so construct these devices that they cannot be operated when engines are in motion, and so avoid the danger from careless dumping of fires.

"A law based on questions of evident safety without impossible features of a mechanical or monetary character should not be opposed by railroads. Such promiscuous opposition puts the roads in an indefensible position and weakens their opposition to real grievances. It also stirs up the opposition of employes. It would be better for the railroads to adopt a more conciliatory attitude in such matters and even join forces with labor in the passage of such legislation. There should not be two sides to questions of mutual interest."

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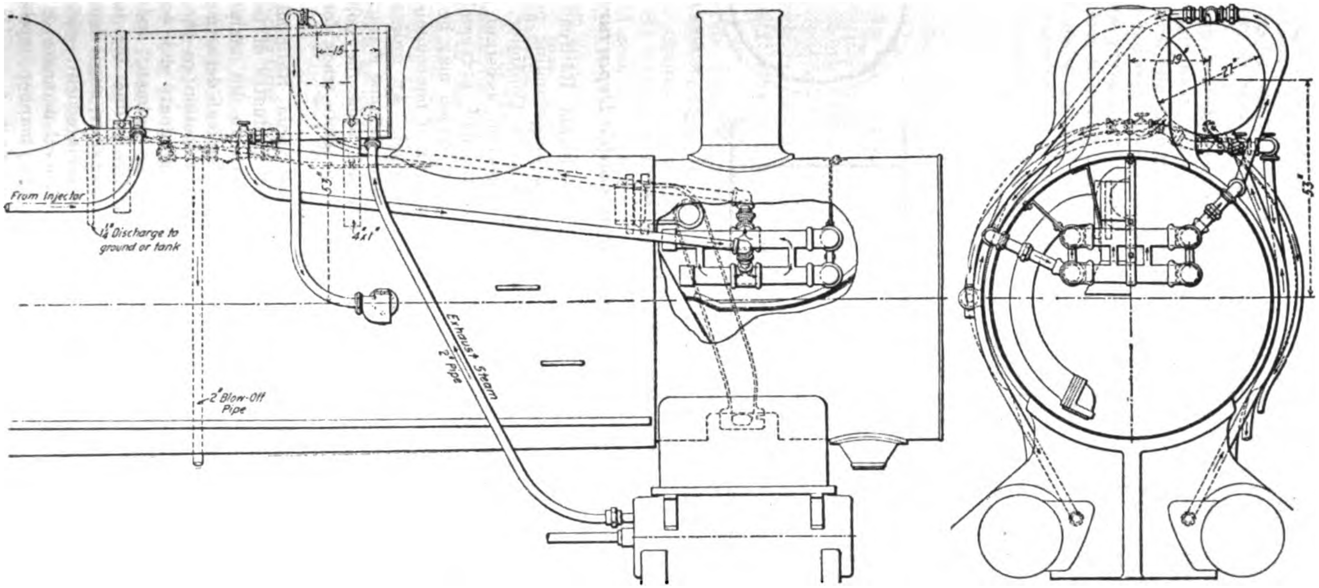
The Brown Locomotive Feed Water Heater.

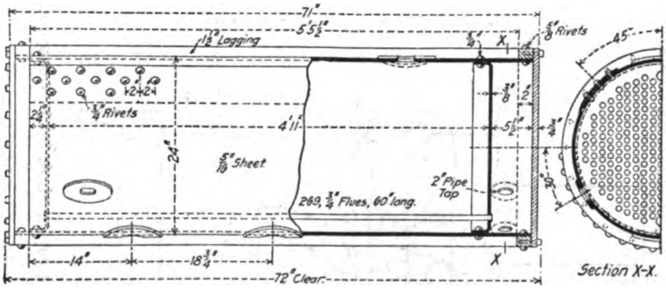
The locomotive feed water heater illustrated herewith, and which was designed by Mr. W. H. Brown, of Minneapolis, Minn., has been in use on a locomotive of the Chicago, Milwaukee & St. Paul Rail-



Brown Feed Water Heater as applied to C., M. & St. P. Locomotive way for nineteen months, running in a bad water district of South Dakota with excellent results, no engine failures or delays occurring which could in any way be attributed to the heater. Three additional locomotives of the same road are now being equipped with this heater, as well as ten locomotives of the Minneapolis and St. Louis, and a few locomotives of the Iowa Central for trial.

In describing this heater the Railroad Age Gazette, from which the above information is taken, says:

"The heater consists of a drum about 6 feet long and 27 inches in diameter, located on the top of the boiler, either in front of or behind the dome. The drum is fitted with tube plates set a short distance from each end and contains 269 tubes ¾-inch in diameter and 60 inches long. The water from the injector passes into the heater and around the tubes. A portion of the exhaust is shunted from the exhaust cavity of both cylinders and carried by 2-inch pipes to the bulkhead in the front end of the drum. The steam passes through the tubes and is condensed by the circulating water, thus giving up its heat, the water of condensation being all returned to the tank through the left injector holes.



Drum of Brown Feed Water Heater

"A water coil made of larger pipes is fitted in the smoke-box directly under the stack, as shown in the illustration. The purpose of this coil is to produce a gentle circulation, separate the mud and purify the water. The heater drum and coil are supplied with blow-off cocks, so that they can be washed out and kept free from mud. In the table below is a comparison of the performance for the month of February, 1908, of C., M. & St. P. engine 167 equipped with the Brown feed water heater, and engine 88 of the same class without the heater:

	Miles		Coal	Tonnage	Coal per
	Train.	Ton.	consumed.	per train.	100 ton-miles.
Engine No. 88..	844	473,800	141,900	561	29.95
Engine No. 167..	1,278	834,300	191,400	653	22.94

"It will be seen that engine 167 shows 34 per cent. more train miles, 14 per cent. greater tonnage and a saving of 24 per cent. in coal per 100 ton miles.

"An interesting discovery was made in connection with the use of artesian water, which caused foaming when fed to the boiler before heating, but when previously heated the gas was liberated and no foaming was experienced."

A Commendable Departure.

The Pennsylvania Railroad Company has broken a long-standing precedent in promoting John S. Considine, of Columbia, Pa., to become assistant supervisor. Mr. Considine had previously been a track foreman, which may be considered the highest rank of noncommissioned officers on the road. An ordinary laborer could eventually become a track foreman, but it has not been the policy of the company to promote track foremen to a higher rank.

The Pennsylvania Railroad Company has employed graduates of technical institutions, both in its maintenance of way and mechanical departments, to be trained for promotion to the important positions. A graduate civil engineer was employed as a rodman, and was considered in direct line for positions of assistant supervisor, supervisor, assistant engineer, superintendent, general superintendent, general manager or vice-president. In like manner mechanical engineers were given a special course of training for the motive power department. Outside of these two lines of promotion it had been impossible to rise beyond certain limits in the operating department.

Realizing that many employes who have not had the advantages of a college education apply themselves so diligently to their work that they acquire a proficiency which should be recognized, the management has been carefully observing the work of all grades of men in the service with a view to promoting those who showed exceptional ability, no matter what their start with the company had been.

John S. Considine was the first to be promoted under the new rule. He had no college education. On the contrary, he entered the service of the company as a track laborer when but fifteen years of age. After five years at this arduous work he was assigned to duty in a supervisor's office. There he acquired the rudiments of civil engineering. Later he was sent out on the road as track foreman, and his work in that capacity was of such a character that the title of general foreman of track laying was created for him. At this point Considine would have come to a sudden stop had it not been for the change in the policy of the company. He had reached his limit unless he could gain a "commission" as assistant supervisor, the place to which he has now been advanced.

There are some 1,500 track foremen on the Pennsylvania Railroad, and this removal of a long-standing barrier will make it possible for any one of them to be promoted to the company's higher ranks. The actual effect of the new policy is to open to every man in the service the privilege of promotion to any place for which he may be fitted.

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Western Railroad Activities.*

Opening of the Belen Cut-off.—The announcement has been made by the Santa Fe that the formal opening of the Belen cut-off would take place about February 1, 1909. The Belen cut-off makes connections between the Santa Fe, Kansas and Oklahoma line and the line in New Mexico, avoiding the haul over the Rocky Mountains that is necessary via La Junta and Albuquerque. The cut-off will also reduce the expenses of the operating department of the Santa Fe, as the grade in the Rocky Mountains was such that locomotives could haul only a limited number of cars over the country traversed by the old route. It is estimated that the cut-off will actually make a saving of 18 hours in transcontinental traffic. The cut-off extends from Belen, on the main line, to Texico, on the Oklahoma line, and is two hundred miles long.

One Branch Line Completed.—The tracks of the Nevada, California, Oregon Railroad have reached Alturas, the county seat of Modoc County, California. For some time the terminals of the road had been at Likeler. According to present plans it is the purpose of the New York owners to build the road as far as Lake View, on the northern end of Goose Lake. That whole region will be well supplied with railways within a few years. The Southern Pacific is making surveys for lines from Ager, on the line of the Oregon and California, to Lake View, from Sisson to Alturas and also from Anderson to the same objective point. There are surveys also from Honey Lake through Susanville, Bieber, Lockout and Canby to Cornell, at the southern extremity of Tule Lake.

Union Pacific New Line.—Bids for the construction work of the Union Pacific's new line between Tacoma and Gray's Harbor, Wash., are soon to be let. The time originally set for the completion of the line—ten months—has been reduced to six months.

Tunneling and Double-Tracking.—The Southern Pacific will immediately double track its line from Reno west six miles to Lawton, in Nevada, and from Truckee east five and one-half miles to Winsted. The company has just completed similar double-tracking along Sacramento from Roseville to Loomis, a distance of seven and one-half miles. Loomis is the start of the proposed new line up the Sierra slope, and work on that project is going right along.

The purpose of all this double-tracking is to secure additional room for the passage of trains through the junction points without disturbing the train yard districts.

On the line just above Loomis there is a tunnel 3,900 feet long. The workmen have bored in far enough already to be under cover from the rain. The Southern Pacific's 2,100-foot tunnel near Dorris, northward of Mount Shasta, on the new line to Klamath Lake, will be completed next spring. Work is being hurried in that, too.

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*By J. Mayne Beltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

Another Western Pacific Tunnel.—Another of the numerous tunnels on the Western Pacific Salt Lake-San Francisco line has been practically completed. This tunnel connects the north and middle forks of the Feather River, California. Two divisions have had charge of the work of driving the tunnel from opposite sides of the center of the mountain. The tunnel alignment was perfect. This great cave is nearly two miles long, and is the longest on the Western Pacific's new line. It is also among the longest tunnels on the Pacific coast.

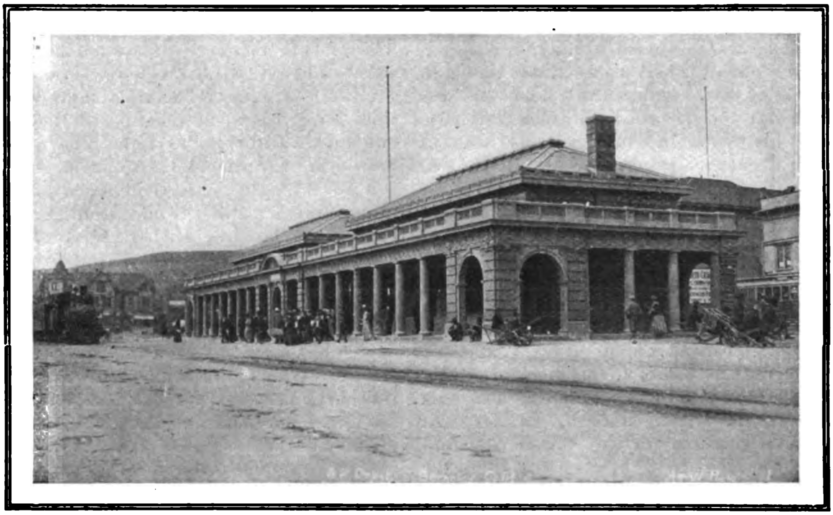
Big Extension Work in Progress.—The extension of Harriman's Southern Pacific-Mount Shasta line and Oregon Railway and Navigation Company's line from Portland, Ore., to Tacoma and Seattle, Wash., under the general name of the Oregon and Washington Railroad Company, is now making rapid progress. It is expected that this very important extension will be completed within less than two years from date.

In securing entrance into Tacoma a tunnel will have to be bored, the total length of which will be 8,700 feet. Its estimated cost will aggregate $3,000,000, and the work will involve the excavation of 460,000 cubic feet of rock. Engineers estimate that the tunnel will extend through solid rock for the entire distance.

In connection with this tunnel a drawbridge and half a mile of steel construction will also be required. This latter work will cost an additional $2,000,000.

Work on Freight Yard and Shops.—The Southern Pacific is hastening with its great work on the big freight yards and shops at Visitacion Valley, which are located near South San Francisco. Already the foundations for the following buildings have been laid:

Machine and erecting shops, 135x460 feet, to be equipped with 120-ton and 15-ton traveling cranes.



NEW PASSENGER AND FREIGHT STATION, SOUTHERN PACIFIC COMPANY, BERKELEY, CAL.

Roundhouse—40 stalls, 450 feet diameter, transfer table.

Planing mill and coach repair shops, 185x335 feet. Freight car repair sheds, 115x440 feet, equipped with 15-ton traveling cranes.

Carpenter and blacksmith shops, 56x380 feet. Power house, 60x90 feet.

Paint storage building, 75x195 feet; storehouse, 55x100 feet.

Large administration building and sundry other buildings necessary for railway use.

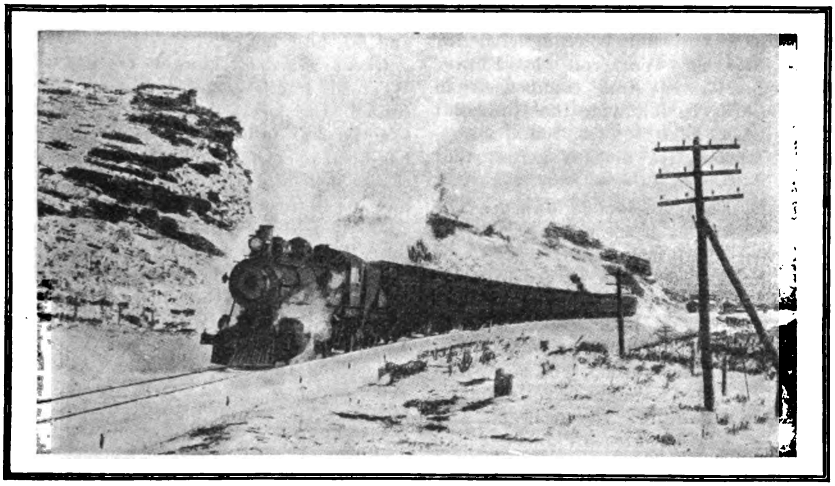
When these yards and shops are completed and in full operation more than 6,000 men will be employed. There are now two tracks through the hills to that point, and another tunnel is being cut to carry two more tracks. On the main freight yards 25 miles of track have been already laid, and soon 30 miles will be completed.

New Station Just Completed.—A very handsome passenger and freight station has just been completed by the Southern Pacific Railroad at Berkeley, Cal. Work has been in active progress on this building for the past six months. The total cost has approximated $40,000. All the front facings—north and south sides—are of California sandstone, handsomely worked. Brick and concrete and red tiling also enter largely into the construction material. The building is practically fireproof. This new and handsome station takes the place of an old wooden affair that stood on the same site for more than twenty years.

Will Bore a Big Tunnel.—According to well authenticated reports the Northern Pacific Railroad Company has recently purchased from the Chicago, Milwaukee and St. Paul line the latter's electric power plant located near Taft, Mont., paying therefor $150,000.

The purpose, it is declared, is only a preliminary step toward commencing operations on a two-mile tunnel in the neighborhood of Lookout Mountain, Montana. This projected bore will be mainly to straighten and shorten the present Northern Pacific line. The western portal of the tunnel will be in the neighborhood of Dorsey, Idaho, and the eastern in the vicinity of the head of St. Regis River. The statement is made that the Northern Pacific's main line will be over this route and that Wallace, Idaho, will become a divisional point.

To Reconstruct the Line.—Over $1,000,000 will soon be expended by the Santa Fe Railroad in the way of reconstructing 311 miles of its main line. This part of the road reaches from Point Richmond, on San Francisco Bay, to Bakersfield—extending along the full length of the San Joaquin Valley. The reconstruction will be very thorough, consisting of the laying of new and heavier steel rails, new ties, reballasting, etc. When the reconstruction work has been completed the road will be oiled in order to keep the dust down.



ONE OF THE UNION PACIFIC'S "THUNDERBOLT" PASSENGER TRAINS LEAVING RAWLINS, WYO., BOUND WEST

The San Joaquin Valley part of the Santa Fe's road is the only bad stretch in the entire 9,430 miles of the system.

Active operations will begin on the work of reconstruction on the first of the new year, and will be crowded forward as rapidly as practicable. This work will not interfere with the regular passenger and freight traffic. This particular section of the road was originally built as the San Francisco and San Joaquin Railroad, but was later absorbed by the Santa Fe System.

Flower Lake Tunnel Completed.—The

Western Pacific's big Flower Lake tunnel has just been finished, and the track laid through the bore. This tunnel is 5,657 feet—1.07 miles. Flower Lake tunnel is at about the center of Elko County, Nevada, in the northwestern corner of that State. It cuts under the Pequop mountains between Goshute Valley on the east and Independence Valley on the west.

The bore was made all the way through solid limestone, and there was very little timbering needed. The Niles Canyon tunnel, which was completed several months ago, measures 4,287 feet. However, the longest tunnel on the Western Pacific's whole line between Salt Lake and San Francisco is the Spring Garden bore, which will not be completed for several months. Work on the Flower Lake tunnel was first commenced in March, 1907. In following the Humboldt river toward Elko it was found necessary to throw five bridges across that stream.

A 2,000-Foot Tunnel Planned.—The proposed terminal of the Southern Pacific to be used by it in connection with the big army transport dock the government now is building around the northern water front of old Fort Mason reservation will involve the cutting of a 2,000-foot tunnel. This tunnel will be opened under Van Ness avenue and through a part of the military reservation. Already the War Department and the San Francisco city authorities have granted the railway permission to cut this tunnel. An open cut will be made, the tunnel built and the cut filled in. For the entire distance the tunnel will pass through loose sand.

Big Order for Cars.—The recent visit to Tacoma, Wash., of William Rockefeller and President Earling, of the St. Paul Railway, has resulted in increasing to 10,000 the number of freight cars which the St. Paul is to build at once for its Pacific coast extension. Several thousand more will be constructed later.

Extension on Old Line Just Finished.—The work of building the Nevada-California-Oregon Railroad from Reno to Alturas, begun nearly 28 years ago, has just been completed, and for the first time a train pulled into Quincy, the county seat of Plumas County, California. For years the line extended to a point about 50 miles this side of Alturas. Obstacles have since hindered the work from that point. Immense tracts of rich agricultural land have awaited the completion of this line for development.

Reconstruction Work Commenced.—The Southern Pacific announces that work will begin at once on the reconstruction of the line from San Jose to Santa Cruz via Glenwood. It will be relaid with 76-pound steel rails. Work on all the tunnels has been completed with the exception of one, and that is about half finished. Wherever possible grades and curvatures are reduced. When the work is finished trains will run from San Francisco to Santa Cruz via Los Altros cut-off and the reconstructed mountain route in two and a half hours, and from San Jose to Santa Cruz in one and one-half hours.

Great Garden Tunnel Opened.—The Western Pacific's great Spring Garden tunnel, the western portal of which is exactly 300 miles from San Francisco, has been opened. The two ends have already met and the light and fresh air now pass throughout its entire length—7,306 feet—nearly one mile and a quarter. This is the longest railroad tunnel in California and the greatest bore of all the forty odd on the entire line of the Western Pacific between Salt Lake and San Francisco. Work was first commenced on the approaches in September, 1905, and now, after nearly twenty-seven months of persistent blasting and digging, the final upper part of the big passageway has been broken through.

Another Southern Pacific Branch.—Late advices from Tepie, Mexico, are to the effect that the Southern Pacific has decided to build a branch to the port of San Blas in order to facilitate the construction of the main line to Guadalajara and Mazatlan. All material will be brought by way of San Blas, and work will begin very shortly.

New Cut-off Approaching Completion.—Within a few months the big Dumbarton bridge across the lower part of the southern arm of San Francisco Bay will be completed, and Southern Pacific trains will be running regularly over the cut-off. Fifty miles will be eliminated by the cut-off. Chief Engineer Hood and General Manager Colvin both claim that the construction of the huge center pier of concrete on which the drawbridge will swing is one of the most remarkable pieces of railroad work undertaken hereabouts. A huge caisson was built and reinforced with a hedge of piles driven deep into the mud, and within the area tons of concrete were formed into a massive cylindrical tower. That has just been completed, and the trestle approaches from each shore are about done.

The great steel drawbridge has yet to be placed and poised, and much finishing work has yet to be done before the rails cross the mile-long bridge and the road made ready to be turned over to the operating department.

* * *

*Automatic Stops and Cab Signals.**

In accordance with the instructions received from the executive committee, subcommittees were appointed at the first meeting held in January to formulate reports on—

1. Various cab signals and automatic stops which are worthy of recommendation.
2. On proper location of automatic stop trips for varied conditions of traffic.
3. The advisability of the use of cab signals as a substitute for fixed signals or adjuncts thereto.

In order that the committee might become informed regarding the latest state of the art, and secure the assistance and co-operation of investors and manufacturers of automatic stop and cab signal devices, a letter published in the technical journals asking those interested to send to the committee plans, descriptions and specifications of their devices. Arrangements were made that specifications received were to be forwarded to each member of the committee in turn in order that comments might be made thereon and sent to the chairman. Few specifications were received, and the recommendations of this committee have been based upon the knowledge and experience of the members rather than from a study and consideration of the descriptions of automatic stops and cab signal devices which have been submitted.

Historical.

Automatic stops were probably thought of and invented shortly after the introduction of the air brake. The negligence or incapacity of enginemen had resulted in a number of accidents which would not have occurred if an automatic device had been used to apply the brake and stop the train in the event of a failure of the engineman to obey the signals. A number of patents have been issued for automatic stop and cab signal devices. Many of the devices are so much alike, a decision of a court would be required to determine the particular merit or invention, which each patent is assumed to possess. A majority of the designs show the inventor to be ignorant of the conditions under which a device of the kind must be used. Comparatively few of the devices which have been patented have been tried, and this committee is not aware that any of these have passed the experimental stage and are in regular use on a surface road in the United States.

Automatic stopping devices are in successful use on the Boston elevated, Chicago elevated, New York elevated, New York subway and the Hudson tunnel roads. On these roads snow and ice do not collect in sufficient quantity to interfere with the working of the apparatus, and the road clearances are ample for the construction used. The results have shown the automatic stop to be a valuable safeguard and to have prevented a number of collisions that might have resulted in a loss of life.

Of the automatic stop and cab signal devices which have been given the most extended trial in the United States might be mentioned the Miller cab signal, the Kinsman automatic stop, the Rowell-Potter safety stop.

Descriptions of these devices may be found in the following publications:

Miller Cab Signal.—Railroad Gazette, pages 128, 172, 219, 206 and 207, year 1902.

Kinsman Automatic Stop.—Railroad Gazette, page 400, June 8, 1894; Railway and Engineering Review, page 211, March 14, 1908.

Rowell-Potter Safety Stop.—Railway and Engineering Review, page 65, November 2, 1895; page 2, January 6, 1900; page 199, March 15, 1902. Railroad Gazette, page 547, 1894; page 378, 1902.

In England and on the continent cab signals are in use on several roads, there being a need of these on account of the dense fogs and the unsatisfactory service and large expenditure required for fogmen. No attempt has been made to use a train control device in connection with the cab signal, as the discipline is such operating officials do not believe the use of the stop to be advisable or necessary. So successful have the cab signal devices been, the Board of Trade of England, at the recommendation of Colonel Yorke, have allowed roads using an approved form of cab signal to dispense with the distant signal, and it is the understanding of your committee that this has been done by one or more roads in a number of instances.

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*Report of committee to the Railway Signal Association, October 13, 1908.

The cab signal systems, as used in England, are of the intermittent contact rail type and similar to a number that have been tried in this country. A full description of the Raven cab signal, which is used on the Northeastern road, is published in the Railroad Gazette of February 14 and 21, 1908. From the trials made on American roads it is evident that devices of the type used in England cannot be made to work in this country on account of ice and snow forming on the contact rails sufficiently to prevent a contact being made between the part on the engine and the part fastened to the track.

Automatic stops and cab signals may be divided into four general classes based upon the method used in transmitting to the engine or moving train the impulse necessary to operate the automatic stop and give a signal indication in the cab. These with their various subdivisions are as follows:

Mechanical Trips.
  Overhead.
  Ground.
Insulated Engine Parts.
Contact Rails.
  Continuous.
  Intermittent.
Inductive.
  Alternating Current.
  Hertzian Wave.

Mechanical Trips—Overhead Arrangement.

Devices of this type are most generally arranged to transmit to the moving train the operating impulse to apply the automatic stop by means of a hanging arm or weight arranged to strike a valve or handle placed on the top of the cab or car and apply the air in case the signal should be passed when in the stop position.

These systems must of necessity be arranged for the hanging arm or weight to come within the maximum clearance line, and in such position would be apt to strike, with probably fatal results, a man riding on the top of a car. The absence of the arm will result in a failure to stop a train when a signal which is indicating stop is run by. Up to the present time, as understood by the committee, these devices do not conform to several of what they regard as essential requirements for a safe and reliable automatic stop and cab signal system. These requirements have been given at the end of this report, and the overhead arrangement of mechanical trip automatic stopping devices do not comply with Nos. 1, 2, 3, 4, 6, 7 and 11.

Mechanical Trips—Ground Arrangement.

Devices of this type are arranged with a movable arm or inclined plane, which when in the operating position is made to come in contact with parts suitably located on the moving train and cause the brakes to be applied, when the train runs by a signal that is indicating stop.

The difficulty met with in operating devices of this type is that the parts on the ground or those on the engine must extend inside of or beyond the permissible clearance lines, in which position they are likely to be broken or knocked out of place, for the parts placed on the ground and the parts on the train are likely to be hit by objects other than the engaging arm, and the brakes be applied when they should not. Ice and snow seriously interfere with the operation of devices of this kind, and these systems, so far as the committee is aware, do not at present meet requirements Nos. 1, 2, 3, 4 and 7.

Insulated Engine Parts.

With these systems it is usual to insulate one truck from the other of the engine or car, insulate an engine from its tender, or insulate one wheel from the other by means of a split axle or insulated wheel center. Pressed fibre is the material by which this insulation is most generally accomplished. With any of the above mentioned arrangements it is necessary that the indication be conveyed to the moving train during the interval of time in which the insulated part is passing over a short insulated section of rail or an insulated joint in the track. The operating impulse is, therefore, momentary and is not continuous.

The principal difficulty met with in systems of this kind is to properly construct and maintain the insulation of the engine parts and to insure that the parts on the moving train will operate properly in the short interval of time available. These systems, it has been found, do not conform to essential requirements Nos. 1, 2, 3 and 11, as recommended by the committee.

Contact Rails—Continuous Type.

Devices of this type are arranged to conduct the operating signal impulse to the moving train by means of a shoe attached to the train making contact with a third rail placed alongside of the main rail, between the main rails, or above, or on the side of the train.

The difficulty experienced with devices of this type is to secure a continuous contact on the third rail, for, unless this is done, the device operates and the brakes are applied when there is an opening in the third rail, irrespective of whether or not the operating conditions make it necessary or desirable that the train brakes be applied.

The continuous type of contact rail system, as at present understood by the committee, does not conform to requirements Nos. 1, 2, 3, 4 and 11.

Contact Rails—Intermittent Type.

With these systems the contact is usually of moderate length and is placed at a point where it is desired to convey the operating signal impulse to the moving train. These points are at the commencement of a block, or where a home or dwarf signal, is placed. The indication given on the train is continued from the time a train passes one contact to the passing of the next contact, or to one where the indication is changed.

The principal difficulty to be overcome in the development and use of devices of this type is to insure that the indication will be received on the moving train, and when received will not be improperly changed before the next contact point is reached.

These systems, as far as developed, do not fully meet requirements Nos. 1, 2, 3, 4, 7 and 11.

Inductive—Alternating Current Type.

The committee is not aware that apparatus of this type has been tried. As described, the system is quite similar to the intermittent contact rail scheme, except that the operating impulse is conveyed to the moving train by induction, a coil of wire attached to the track acting on a suitably arranged coil placed on the train. The arrangement can be made to keep within the clearance lines and seems to be capable of successful development provided the necessary alternating current is available at the many points where same will be required.

Requirements Nos. 1 and 2 do not appear to be complied with by systems of this type, of which the committee has knowledge.

Inductive—Hertzian Wave Type.

This type of apparatus makes use of a generating device placed on a train or at a fixed point from which the Hertzian waves are sent out, preferably in the direction in which it is desired to give the indication. A collector of suitable form and arrangement is placed on the train or point at which an indication is to be received and the proper Hertzian waves are supposed to be collected and actuate the apparatus to give an indication.

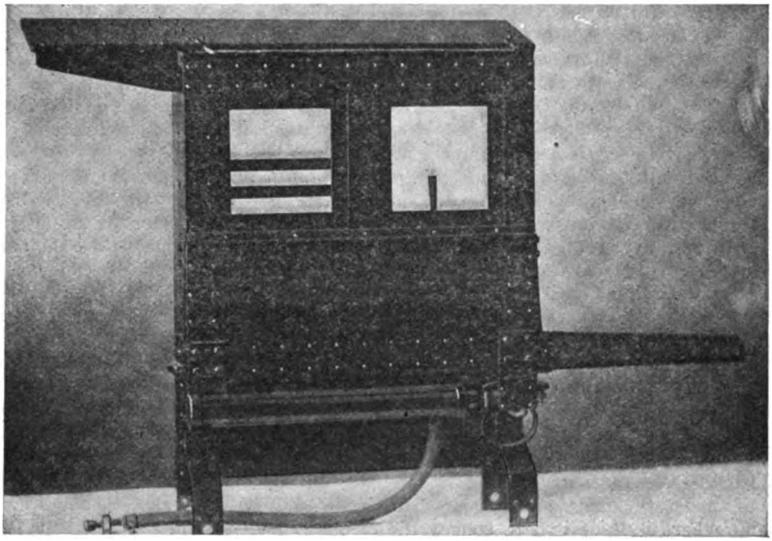
The principal difficulty with apparatus of this type is in selecting the particular train or fixed point which is to receive the intended indication and to provide protection for a train when there is a failure of the wave generating apparatus.

It is understood by the committee that these systems do not comply with the following requirements for safe and reliable working: Nos. 1, 2, 3 and 6.

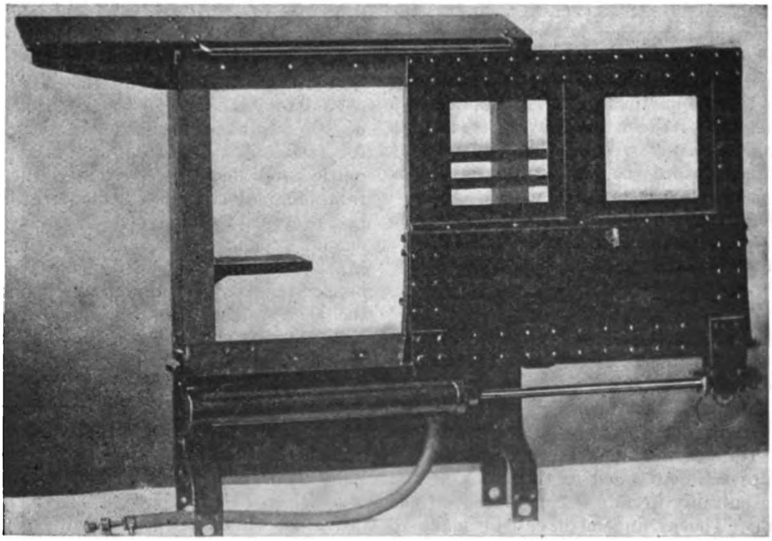
Recommendations.

Up to the present time descriptions and drawings of automatic stop and cab signal devices referred to this committee have not included those which seem to be the best and the most practicable. Your committee is not in a position, and does not think it advisable, to recommend for trial any type of cab signal or automatic stop device with which they are familiar, believing that demonstrations of the practical workings of these systems should be made by the patentee, the manufacturer, or under the auspices of the block signal and train control board of the Interstate Commerce Commission.

That those interested in the design and manufacture of automatic stop and cab signal devices for use on surface railroads may know of the operating conditions under which these systems will be used, and the requirements as to safe and reliable working which must be met in order that these devices may have the approval of this association, your committee submits for adoption the following requisites of installation to which automatic stop and cab signal systems must conform, to be considered safe and reliable in operation:



Showing Exterior View of Cab with Sliding Panel in Closed Position



Showing Exterior View of Cab with Sliding Panel in Open Position posts are rigidly connected by upper and lower channeled metal guide bars, in which the sliding side frame of the cab is arranged to slide. The sliding panel is provided with the usual cab side windows. The vertical end posts are provided with inset joint strips of felt or other suitable material and form tight joints with the movable panel when in closed position. Two leaf springs prevent rattling of the panel when in its normal, or closed, position. Another leaf spring carried by the rear edge of the panel is engaged and acts as a cushion when the panel is sliding back to its normal position, and when closed a suitable lock arrangement is provided to automatically lock the same.

A three-way controlling valve is used to admit compressed air or steam to and exhaust it from a cylinder provided with a piston and rod which is connected to the sliding panel and is used to move the same forward and back at the will of the engineer or fireman. In case a collision is about to take place the engineer or fireman will move the three-way valve to admit steam or compressed air to the back end of the cylinder and push the piston forward, which first unlocks the sliding panel and then moves the same forward to its open position. This enables the engineer or fireman to jump from the running board from a standing position, and not be compelled to crawl through the side window of the cab or be pinned within.

Further information regarding this device may be had by addressing John N. Holm, 1919 Filmore street, N. E., Minneapolis, Minn.

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*The Derailment of Tenders.**

There are few railroads which have not experienced serious trouble from derailed tenders, and this condition continues and is more pronounced with the large and high tanks used on modern locomotives, so that the subject is worthy of some special investigation and discussion. It is rather remarkable that the experience thus far in finding the cause and cure of tender derailments has not led to the adoption of more uniform standard practice, but in many instances the diagnosis has not been correct and the cure has been due to a combination of several remedies and not always to the one particular change adopted. The knowledge relating both to cause and remedy is thus confused. Under such conditions it is difficult for mechanical officers to agree on a standard practice for the various details of tenders which are connected with their safe running. For this reason, also, a sovereign remedy will not here be proposed, but some of the principal causes of derailments will be described and some improvements in ordinary practice suggested.

The cause for derailments usually assigned at first is bad track, and this may be accepted as contributing cause, for in most cases the tender might not have revealed its defects on first-class track. The derailment may indicate a poor spot in the track, but the fact that freight cars with the most ordinary kind of trucks have passed over it safely can be taken as proof that something peculiar to the tender has caused it to leave the track, and a careful investigation will reveal the cause. Several differences between a box car and a tender in their track relations are unfavorable to the tender in respect to derailment. The tender is very short, the distance between center plates being 13 to 16 feet, while on the box car it is 30 feet, or about twice that on the tender, and this short wheel base in various ways makes it harder for the tender to stay on rough track. The couplings of the tender, both front and back, are as a rule more rigid than those of a car, and this is doubtless a frequent cause of derailment, often unsuspected. The relation of the load on the two tender trucks is quite variable, the rear truck carrying the larger part of the load, while in a car the load is evenly distributed. The center of gravity of the load on the tender is high and the water portion is liable to shift violently, tending to raise the wheels on one side. The total load of a 50-ton car and of a large tender with full load of water and coal is about the same, 140,000 pounds.

So far as the body or tank portion of the tender is concerned, considerable improvement has been made by making it as wide as the cab, usually 10 feet, with a water bottom extending under the coal space. The weight of a cubic foot of water is about 38 per cent. greater than that of bituminous coal, and there is therefore an advantage in storing the water at the lowest point rather than the coal. Tests with a float in the water space have shown that the wave due to the surging of water in a locomotive tank may be as high as 10 or 12 inches when running at 40 miles per hour, and this action has been almost entirely eliminated by the use of longitudinal baffle plates extending fully two-thirds the length of the tank. By increasing the length of the tank as much as ordinary turntables and roundhouses will allow, in addition to the use of maximum width, large water capacity is obtained without increasing the height and the center of gravity of the load is kept low. Something can be done also, for the same purpose, in the design of the bolsters, so that the body will rest low upon the trucks, the side sills coming down 2 or 3 inches below the top of the wheel.

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*From Railroad Age Gazette.

The drawbar between engine and tender is often of a crude design and of rough workmanship, and on account of its rigidity it is a frequent cause of derailment. This drawbar should be horizontal and flexible, for if it is not there will be a tendency to lift the tender, thus reducing the weight on the front truck and causing its derailment. When tenders are derailed on straight track it is frequently due to the driving wheels depressing the track irregularly, and if there is a soft spot in the track the excessive weight on the back driving wheels may cause a temporary depression so that the tender truck wheels following will climb the rail. This is especially true where rigid diamond trucks are used, and the case is aggravated by a rigid coupling. The interlocking of the couplers between the tender and the first car has caused derailments; so also have the chafing and locking of the buffers at the same point resulted in the rear tender truck leaving the rails.

Regarding the relation of tender trucks to derailments, there is the greatest diversity of opinion and of track construction. It is safe to say that the best practice favors the use of pedestal trucks with equalizers for the tenders of high-speed passenger locomotives, and some roads prefer to use this type for all large locomotives, but it is also true that a number of the large trunk lines use diamond trucks under the tenders of locomotives for their fast express trains. The important point about a diamond truck in such service is to secure flexibility so there will be no tendency for the truck to tilt on rough track and raise a wheel from the rail, for there is then danger of its mounting the rail and leaving the track. The pedestal truck has the advantage in this respect in securing more perfect equalization. New trucks have caused derailment because the bolsters have been fitted roughly in their guides and they chafe and stick, causing a tilting action as effective in producing derailment as want of equalization. The general stiffness of new trucks roughly built has often caused derailment which would have discontinued after they were limbered up and the working points had smoothed down to a bearing. In this way many have been deceived and have attributed the remedy to some change in the spread of side bearings or in the use or disuse of front side bearings.

The center plates and side bearings of tenders have an important influence upon their safety on the track, and there is nothing connected with the running gear of locomotives which appears to be so little understood or which has developed such a diversified practice. The investigation which is to be made this year by the Master Car Builders' Committee on Center Plates and Side Bearings should be followed up by the Master Mechanics' Association, and a committee should be appointed to report on the best designs of these details for locomotive tenders. The center plates of large tenders are usually too small and those having a spherical bearing are not well suited to a top heavy vehicle where there is considerable motion between the side bearings, and especially where there are no front side bearings. Steel tender bolsters with center plates case integral have very rough bearing surfaces and the bearing when new has such a small area that the unit pressure is excessive. The rough high spots chafe and cut and the friction thus produced prevents the free movement of the truck. These plates should be ground to a uniform bearing and well lubricated with graphite grease. It is the excessive friction of center plates and side bearings which has led to the disuse of side bearings on the front tender truck, and if these were properly designed there appears to be no good reason why a front tender truck should not have side bearings the same as a car. It is probable that the best center plate for a tender is one having flat bearing surface and a large diameter, or better still one having roller bearings of good design. With such a center plate, having little friction and carrying the bulk of the load, there can be no objection to the front side bearing.

In preparing this article we have endeavored to get the best opinions from locomotive builders and motive power officers, and have collated them so far as there is any general agreement. There is, however, such a diversity of opinion on some essential points that we hesitate to make positive statements and therefore suggest that the subject of tender derailments and the best design of center plates and side bearings should be carefully investigated by the Master Mechanics' Association. The conditions as above described certainly warrant such an investigation, and if properly made it must lead to a more uniform and improved practice in the construction of locomotive tenders.

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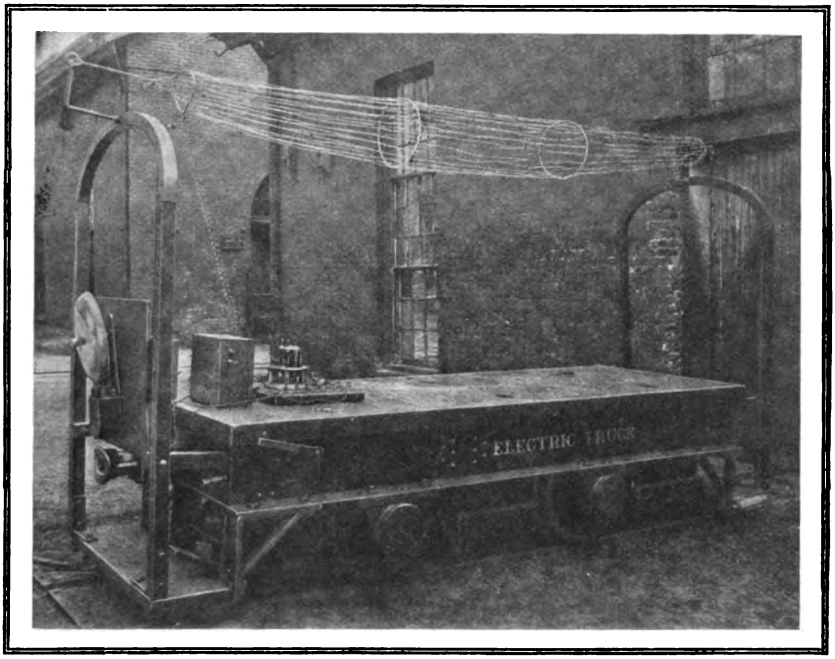
*Wireless Telegraph Signaling on Railroads.**

The accompanying illustration shows an experimental car used for demonstrating the transmission of signals to moving trains by wireless or radio-telegraphy as designed by Dr. F. H. Millener and constructed at the Union Pacific shops at Omaha, Nebraska. The car carries antennæ, which receive the current and impart it to relays and magnets, which in turn start a motor attached to the car controller, thus starting the car as one of the experiments.



EXPERIMENTAL CAR USED IN DEMONSTRATING THE PRACTICABILITY OF TRANSMITTING SIGNALS TO MOVING TRAINS BY WIRELESS OR RADIO-TELEGRAPHY

Dr. Millener states that his experimental car is not operated by power transmitted from a remote point, but is operated by a storage battery, and that the experiments were simply the transmission of impulses from a central point as a means of starting the car, ringing a bell or imparting other audible signals to the operator in charge of the car.

This experimental car was so arranged that, by wireless telegraphy, relays opened and closed circuits to operate a whistle or bell, and if desired the mechanism could be designed to set the brakes by the wireless transmission of current from a central station.

It is stated that in actual practice on long roads the method of stringing a wire parallel to the track and imparting the current to the car by the induction method would be entirely satisfactory. It is also said that the central-station method has been used over distances of about five miles, and that this limit was due to a lack of facilities rather than inability to transmit to a greater distance. It is held that the practicability of this wireless system of transmitting signals over greater distances for railway service is to be demonstrated on the Union Pacific Railroad between Omaha and Fort Leavenworth.

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*By Frank C. Perkins.

The inventor holds that there is little chance of transmitting power for commercial purposes by a wireless system, and maintains that telephoning to a moving train is not a success, due to the inability to provide a satisfactory telephone instrument for this service, but that equally good results can be obtained by a system of transmitting signals by wireless telegraphy to the trains, as there is no particular benefit to be gained by the engineer conversing with the train dispatcher.

Dr. Millener believes that he can communicate with as high as thirty-five trains, selecting any train without signaling the others. A remarkable feature of this experimental electric truck is that, by the use of a mechanical selective system, the inventor has been able to move the storage battery car shown in the illustration, or rather control it, giving it four speeds ahead, stop it, and reverse it at the same number of speeds, or starting or stopping it at will. It was also possible to ring a bell without interfering with the other signal, and the inventor maintains that he sees no reason why gates or bells at a crossing, as well as moving trains, may not be so operated and signaled.

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Lignite as a Fuel.

To adapt locomotives to the use of lignite fuel throughout extensive sections of the South and central West has required certain modifications of ordinary designs. Grates, nettings, nozzles and ashpans cannot be fitted for the use of either bituminous coal or lignite at will, and it is with somewhat indifferenct success that these parts have been specially designed for the burning of the latter class of fuel. A locomotive fire fed with lignite has never been a dependable quantity to the extent that dead engines often result from an attempt to make a grade with the valves at late cut-off and a fire of the customary thickness. It is not unusual for the grates to be swept from the flue sheet to the door under these conditions, in spite of the care of the fireman. It is not necessary to state that all the troubles of a very light fuel, the quality of which differs with each tender filling, have emanated from the use of lignite as a locomotive fuel. It is not surprising, in view of these facts, that oil has been substituted at an increased annual fuel expenditure, but decreased loss due to engine failures on several railroad divisions in the lignite territories. With the increase in railroad mileage and, therefore, of fuel consumption within this territory, the cost of oil or bituminous coal transportation is such as to demand the installation of combustion apparatus which will burn lignite with better results than have heretofore been attained. Several locomotives entailing radically new designs in firebox and front end construction have been built and are being tried out in service in the West. It is to be hoped that the operation of these engines will be such as to open the way to a profitable solution of the difficulty. When this is the case it will, perhaps, be possible to go farther and produce a means for burning the poorer qualities of this fuel, of which there is such a vast supply at hand. There are in New Mexico, for instance, a very large number of deposits of lignite which are of indifferent quality, but which, it would seem, will at some time be put to use, and as the railroads are by far the greatest users of fuel in this unsettled country, these deposits stand only a small chance of being worked until the lignite-burning locomotive creates a demand.—The Railway and Engineering Review.

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Technical Contributions

A MIDNIGHT COUNCIL OF THE AIR BRAKE FANS

(THE REST OF IT)

BY WILL W. WOOD

Before the outfit scattered to their belated rest the other night—or morning—from the reading room at the roundhouse, every bit of the piping of the new No. 6 ET equipment had been under discussion, and it had been decided as to what to do in case of leakage or failure of any part of such piping out on the road. The air brake instructor wasn't present, but the travelling engineer kindly umpired and advised during the event. In order to understand the ET brake the instructor has said that you've got to study it in parts; that the whole thing should be divided for study into three main sections—the distributing valve, the duplex pump governor, and the general piping system—we were on the pipe line, and of those three pipes connecting to the left of the distributing valve, failure of the two lower ones, and the remedies, was pretty thoroughly covered in my preceding, partial report of the *soiree* of experience and technical development.

"They's another pipe connectin' on the left a the distributin' valve," stated Fireman Daly, "an' one time, Buster Burns he busted it off."

"What for?" inquired the travelling engineer.

"Aw, I mean *she busted on him*," Daly explained.

"I see. The pipe you speak of supplies main reservoir pressure to the distributing valve to be used as the locomotive braking pressure in graduated amount, which takes the place of the ordinary auxiliary reservoir pressure. Burns has had the No. 6 ET equipment during the times that you have fired for him. The pipe referred to got broken off; how did it happen, and what did Buster do?"

"Say—what Hank Williams said about rotten air pipin' what they do at the locomotive works ain't no josh; it's fierce. Say—the secon' trip we went sout' wi' that engine it was on the Fourt' o' July. While we's makin' the stop at Skillett's some kid t'rowed a firecracker at Buster, an' it drops an' goes off 'longside the distributin' valve, an'—*Whoosh!* Buster heard the air a-blowin', an' as soon as she stops he gets down an' finds this top pipe on the left side of the distributin' valve smashed clean off."

"It was a simple coincidence," was the opinion of the T. E.

"Naw, it was one o' them sinful cannon crackers," returned Daly; "but Buster, he fixed her, all right."

"How?" the travelling engineer asked. Experience here, and information coming; everybody was at attention.

"W'y, Buster he jus' close' the cock in the bust pipe, an' goes on."

"Oh, that's so. The most of us are not used to a cut-out cock in that pipe. In nearly all of the old, No. 5 equipments, there is a cut-out cock in the branch pipe connecting the brake pipe with the distributing valve, but none in the main reservoir supply pipe. With the later furnishings of the No. 5 ET, however, and *standard* in the No. 6 brake, the location of those cut-out cocks is reversed; that is, there is none between the brake pipe and distributing valve, but there is now a cut-out cock in the pipe that supplies the main reservoir air for use in the distributing valve as locomotive braking pressure at any kind of an application; and if this latter pipe breaks between the cut-out cock and distributing valve, it is only necessary to close the cock and go right on—but without the engine and tender brake operative by either the automatic or independent brake valves. But, suppose the pipe should break between the cut-out cock and main reservoir—what then?" he asked.

Of course there is nothing to be done in that case but to plug the broken pipe; and it was decided to stop at once if the pipe rupture occurred while running, close the brake-pipe cut-out cock under the automatic brake valve, place the brake valve in release position, and close the main reservoir cut-out cock to stop the waste from that source while a plug was being prepared—or a blind gasket to fit a pipe union, which would be much better; after which, open the closed cut-out cocks, return the brake valve to running position (after the train brakes have released), and proceed, remembering that you then have no brake on the engine or tender.

"I understand," said Engineer McGinniss, "that with the cut-out cock as now placed, in the main reservoir supply pipe, the entire locomotive brake can be made wholly inoperative, and a cock as formerly placed in the brake-pipe branch to the distributing valve would be superfluous—for the purpose of excommunicating the latter mechanism; but the brake-pipe branch is the one that most frequently is reported broken in this equipment; and if it does what should be done, in the absence of any cut-out cock as a possible help toward closing the pipe?"

"You know. Loosen up," suggested Fin.

"Well," McGinniss resumed, "first prevent waste of main reservoir air by lapping the automatic brake valve, if not already in that position; then place a blind gasket in the union of the broken pipe, or, if the union is not between the point of rupture and the brake-pipe strainer-tee, unscrew the piece of pipe from the strainer-tee and turn a wooden plug into the tee; release the locomotive brake with the independent brake valve, release the train brakes with the automatic brake valve, and resume your journey. Unlike the No. 5 equipment, there will be no subsequent annoyance from the locomotive brake sticking; and while it will be unaffected by brake-pipe reductions, the locomotive brake can still be applied and released as usual by the independent brake valve; but probably the full release position will have to be used, even with the automatic brake valve in running position."

All right; McGinniss' word is usually final. Someone then inquired what to do in case a brake-cylinder pipe broke off, and everybody said that was dead easy; if the break was between the brake-cylinder and brake-cylinder cut-out cock, just close the cock; if the other side of the cut-out cock, plug or blind-gasket the pipe. If, however, the main line of the brake-cylinder pipe should break off somewhere between the distributing valve and the point where the individual brake-cylinder pipes branch off from it, the only thing to do is to close the cut-out cock in the main reservoir supply pipe, and go on without any brake on the engine and tender—always presupposing, of course, that it is impossible to properly repair the pipe, whatever one may have been broken.

"'Tain't so all-fired a simple proposition as you all think, about a-bustin' off a brake-cylinder pipe," declared Hank Williams, again bucking into the fray. "My tender-brake cylinder pipe broke off, but I was a-layin' off that trip, an' there wa'nt nobody else, so they took Peggy Grimes outen the yards and sent him—they sent her out on freight, an' that's why I layed off. The fireman said the pipe must a been broke off some time afore Peggy noticed it, for Jim, he heard the air a blowin' whenever the brake was set; but he said the driver brake held all right, an' that's what's mystifyin' to me."

"There's a choke-plug in the cut-out cock in the pipe that leads to the tender-brake cylinder," stated Polk Barrows; "also one in the truck-brake cylinder cut-out cock, so located in case the hose in either brake-cylinder line should burst that the pressure won't escape from the other locomotive brake-cylinders faster than the distributing valve can supply it; I think the hole is 5-64-inch in diameter."

"My goodness, that's a big hole for a choke-plug. Well, when Peggy did discover it—so Jimmy says—he looked for some cut-out cock under the tender, natcherally enough; hunted from the brake cylinder clear to the hose; couldn't find none, an' he wasted a hull mint o' time a fixin' a blind gasket an' puttin' it in the pipe union close to the brake cylinder, when if he'd jest a hunted a little further he'd a found a cut-out cock in that pipe line, all right, but on the engine-side o' the hose connection—the c'rect place for it.

"But the second trip I made on passenger with this here engine," Hank continued, "the little ⅜-inch reducin' valve pipe broke off—why, doggone it, they ain't no angle-iron ner bracket to hold up the reducin' valve, a-tall; that little pipe has to hold up itself an' the reducin' valve, too, an' this time the whole works jest drapped."

"Any o' your pipes that ain't been busted, Mister Williams?" inquired Daly—"not personally, o' course; air pipes, I'm meanin'."

"I whittled out a plug from a flag stick an' drove it in the broken pipe towards the reducin' valve," Hank proceeded, "an' I went along all right, but I didn't have no signal line pressure, ner independent brake on the engine, an' every time I set the automatic the engine an' tender brake wouldn't take hold, nohow, an' I've never been able to figger out jest what that reducin' valve's got to do with the engine brake a doin' business at a automatic application."

And nobody else present knew, either—but Polk Barrows; and as he explained it, it's worth remembering.

"In the first place, Mr. Williams," said he, "it wasn't at all necessary for you to have plugged the broken reducing-valve pipe toward the reducing valve; you should have used the plug in the broken end *toward the independent brake valve.*"

"Land sakes! Air you sober, Polky?"

"Some sober. If you had just unscrewed the regulating nut of the reducing valve until the regulating spring was completely slack, no more air could then have fed through the reducing valve."

"Oh, Glory. Why didn't I think o' that?" said Hank; "but why the plug in the other direction, Polky, boy? An' what's the reason the engine brakes didn't hold?"

"That's easy. You know that whenever you make an automatic application the air of the application cylinder of the distributing valve flows into the little copper pipe that runs up to the independent brake valve, and through a port in its rotary valve (if in running position) into the other, connecting, little copper pipe that leads to the automatic brake valve; this application-cylinder pressure would lift the rotary valve of the independent brake valve off its seat, if a greater force didn't hold it down; and that greater force is the 45 pounds per square inch of reducing-valve pressure upon the whole top side of the rotary valve. In your case, the cutting off of the supply of reducing-valve pressure on account of the broken pipe removed the holding-down pressure in the independent brake valve, with the result that at an automatic application of the brakes the application-cylinder pressure lifted the rotary valve, uncovering the two outlets to the atmosphere—one, to the broken reducing-valve pipe; the other, the independent brake-valve release port in the center of the bottom of that brake valve. Now, there is a comparatively small volume of air contained in the application chamber and cylinder, no matter what its pressure, and it escaped at those two exits as rapidly as it was supplied; and the very slight sound that would have been made by its escape was drowned in the brake-pipe discharge. You understand, of course, that the locomotive brake-cylinder pressure will be just exactly the same as that of the application cylinder, and the loss of the latter means the nonsupply of the former.

"If, in addition to cutting out the reducing valve by slacking off the regulating nut, as I advised," Polk continued, "and plugging the broken pipe toward the independent brake-valve—if you had also plugged the release port in the bottom of the independent brake valve (there's screw threads there, for ⅜-inch pipe), your engine and tender brakes would have held all right, and you would have had the loss of nothing but the independent brake valve and the train air signal; in passenger service you seldom need the former, and in freight service the latter not at all."

The travelling engineer was sitting straight up and taking notice of this fireman who had the ET equipment so well understood, and the air brake instructor has said that one must understand the common, automatic brake pretty thoroughly before he can comprehend the workings of the ET system.

"Gee!" said Daly in an undertone, "I wisht I was hep on the air like Poke Barruz; he'll be wit the Westin'house air brake people one o' these days."

"Not on yer wad," replied Fin; "he's a church member, an' dat's too near Pittsburgh."

"And now," Engineer McGinniss was talking, "I propose that we conclude this very entertaining and instructive session by a brief reference to possible rupture of the air pipes that connect with the duplex pump governor as used in the No. 6 ET equipment. If the pipe that conveys main reservoir air direct to the high-pressure governor top—the pipe that is generally connected to the supply side of the main reservoir cut-out cock—should become broken off, it is a quite simple case; plug the broken pipe in some manner, and you will not note any difference while your brake valve is in running position, pressures will be maintained as usual; but upon applying the automatic brake, or lapping the brake valve, the pump will be out from the controlling influence of the governor, and should be throttled when the red gauge hand rises as high as is desirable.

"If the pipe leading from the automatic brake valve to the excess-pressure governor top should break off, that governor top will be noneffective; of course, the pipe should be closed—blind gasket and all that—to prevent the waste of air when the automatic brake valve is in release, running or holding positions, and you can then keep going along; the only difference now will be that the air pump will be controlled by the high-pressure governor top, only, and with the automatic brake valve in any position; maximum pressure in the main reservoir during the rest of the trip should not be especially undesirable, but if you think otherwise you can easily reduce its adjustment.

"Rupture of the pipe that conveys feed-valve pipe pressure to the regulating spring chamber of the excess-pressure governor top is a matter of more consequence," McGinniss informed us. "You must first plug it against loss of pressure, as is of course understood. By the way, most of the older No. 5 equipments have this pipe connected to the top of the spring case of the governor, with a stop cock in the pipe, and if this stop cock should become closed the effect will be the same as if the pipe was broken off and plugged; and that is, you would have a *low-pressure*, instead of *excess-pressure*, governor top, and adjusted to 20 pounds or whatever excess-pressure has been regularly carried with the brake valve in running position. Of course, a standard pump governor can not be adjusted to regulate pressure at less than about 40 pounds, with the high boiler pressure that is carried, and that's all the pressure you could pump up with the brake valve in running position, under the conditions. To effect the remedy when this pipe is broken off, also break off (disconnect) and plug the lower pipe to the same governor top—the one just previously referred to, connecting with the automatic brake valve—and proceed on your way, with the high pressure governor top in control of the pump."

The rest of the No. 6 ET piping was voted so simple that if a fellow should not know what to do when any part of it gets broken off, it would be a waste of time in telling him; so McGinniss had the last word, as usual.

"Let's beat it," suggested Fin McCool. "Me fer de Exchange, an' a stack a Honey Buckshot's raised pancakes."

"And me for me ostermoor," agreed Daly.

* * * * *

ELECTRICAL RAILROADING

BY ELWOOD GRISSINGER

The lead given to the armature conductors when connecting them to a commutator to suit certain types of windings must not be confused with the lead given to the brushes with respect to the neutral position of an armature winding in its magnetic field. Three diagrams will aid in describing the lead given to brushes. These diagrams are here referred to as Figs. 1, 2 and 3. The first, or Fig. 1, represents a simple two-pole magnetic field without any armature therein. This figure shows by its dotted lines the path and direction of the magnetic lines of force passing from the "N" to the "S" pole. It is seen that they pass in straight lines. There is nothing to change their direction from the straight path. As a matter of fact, however, a greater number of lines of force pass between the adjacent pole tips than through the center of the pole faces, for the reason that the distance through the air is much shorter. If the pole faces were plane faces instead of concave, then the magnetic field would be uniform across the entire pole face. An air gap offers a tremendous resistance to the passage of magnetic lines of force. Wherever the air gap is less, a greater number of magnetic lines will pass through at that point. The resistance offered to the passage of magnetic lines is termed reluctance.

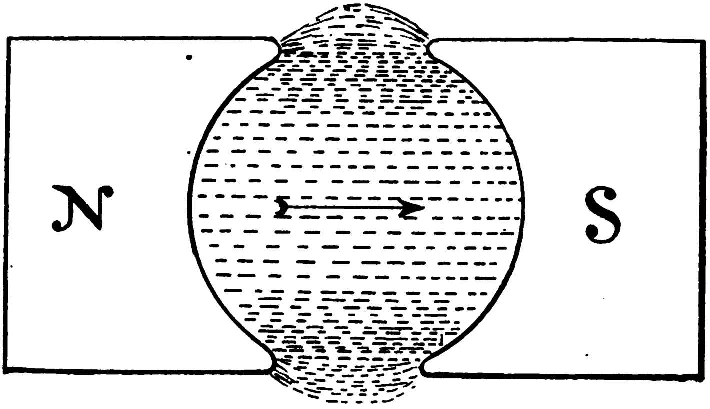


Fig. 1

If an armature core is inserted in the above magnetic field, the result will be similar to that shown in Fig. 2. It is here seen that the lines of force no longer travel in a straight line across the entire faces of the pole pieces, but that they curve upward and downward as they pass through the armature core from one pole to the other. The degree of curvature will depend upon the dimensions of the air gap that will exist between the armature core and its shaft. Even if there were no actually visible air gap between the core and the armature shaft, still the mere fact that the shaft and core are not an integral mass, but separate structures, introduces a *joint* and this offers resistance to the passage of magnetic lines of force. Therefore, in all equipment through which magnetic lines of force are caused to pass, the aim is to have as nearly an unbroken path as possible. The more breaks there are the greater will be the magnetic reluctance, and consequently there will be a loss in efficiency. It is surprising how many lines of force are lost as a result of every joint or break in the magnetic circuit. Greater exciting currents must be employed to overcome such losses.

Thus far the lines are shown as they travel through the iron alone. Fig. 3 is intended to give an idea of what happens to the lines when a current is passing through the armature conductors. It will be recalled that the armature current as it circulates through the turns of wire wound in the slots also creates a magnetic field in the armature iron. When this occurs the armature magnetic field *distorts* the main magnetic field and causes it to bunch up somewhat. This is called *distortion.* It is also termed *armature reaction.* The amount or degree of this distortion depends altogether upon the load upon the dynamo or motor, other things being equal; or what amounts to the same thing, it depends upon the magnitude of current flowing in the armature winding. The stronger the armature current the stronger will be the armature magnetic field and, of course, the greater will be the effect of armature reaction.

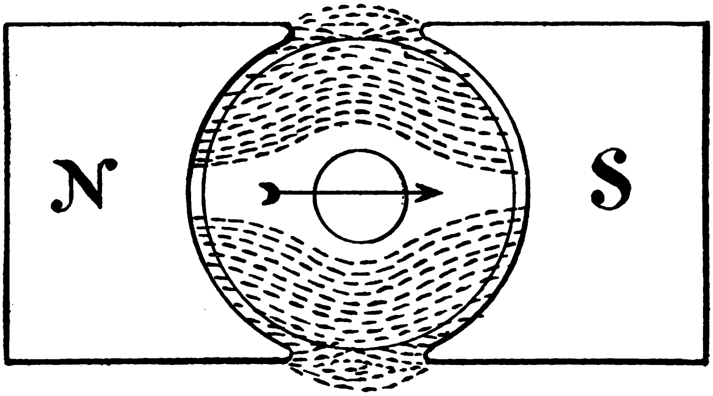


Fig. 2

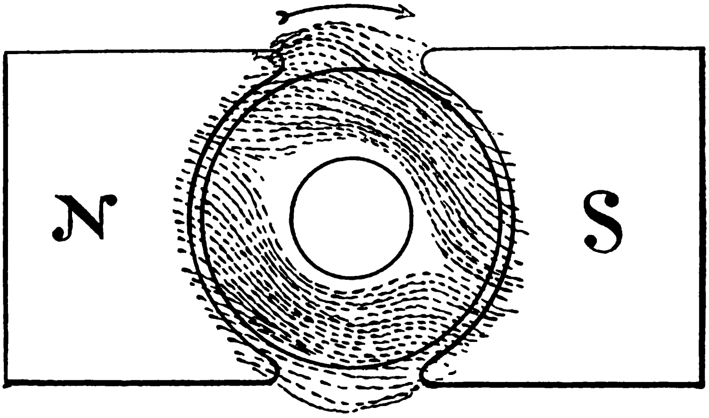


Fig. 3

A clearer conception of the lead which must be given to the brushes to overcome sparking due to a distorted field can best be obtained by reference to Fig. 4, which is drawn to represent the simplest form of a dynamo or motor, having but one pair of field poles, a single armature coil or loop, the commutator omitted. It is assumed in this case that the magnetic field is uniform. A single armature coil is shown as a rectangular loop. Its position with respect to the magnetic field of force is vertical. In this position it is embracing the maximum number of lines of force and it is *cutting* none. It is in this position that the direction of the induced current in the coil will change. This position of an armature coil is called the *neutral* position. Sparkless commutation at the brushes from such a loop is obtained in a working armature by having the brushes so set that when the coil or coils come into a neutral position with respect to the magnetic field the brush will make contact with the commutator segment attached to such loop or loops.

As the loop moves away from the vertical position, however, a current is induced in it, passing through the brush into the external circuit in the case of a generator; a current being passed into the loop from the brush in the case of a motor. If, however, the same loop is placed in the distorted field shown in Fig. 3, it is seen that in order to get the loop into the neutral position where it is embracing the maximum number of lines of force, the coil will not be in a vertical position with respect to a horizontal line drawn through the poles of the two-pole field as shown, but that the loop must be turned to the right in the case shown, i. e., the loop must be turned at an angle from the vertical equal approximately to the angle of distortion. The coils or loops on the armature are fixed in position on the armature. It is therefore necessary to move the brushes to the right in the case shown, moving them sufficiently to compensate for the angle of distortion. This movement gives the brushes their *lead.* This lead is given to the brushes so that all of the coils of the armature when they reach their neutral position, as a result of the rotation of the armature, will be connected with the commutator segments then in contact with the brushes. In this manner, theoretical sparkless commutation at the brushes of direct-current motors is obtained. The direction of rotation of an armature in the field shown in Fig. 3 is assumed to be as shown by the arrow at the top of the figure. For this direction of rotation the brushes would be given a lead to the right. If the direction of rotation were reversed the distortion would be reversed, and the brushes would need to be given a lead to the left.

Some generators and some motors unfortunately do not always show sparkless commutation, no matter whether the brushes are shifted or not. In early forms of machines (and now and then, modern ones), the neutral points of armature windings are so narrow that some sparking is evident at the brushes because of the changing direction of induced currents in the armature windings as the coils of such windings are passing through the neutral zone. The exercise of proper care in design, coupled with the use of good material in the field poles and armature core, will give a sufficiently wide neutral zone so that when the brushes are so set that they will show no sparking at no load the same condition will be maintained as the load upon the machine increases and the current strength in the armature approaches its maximum.

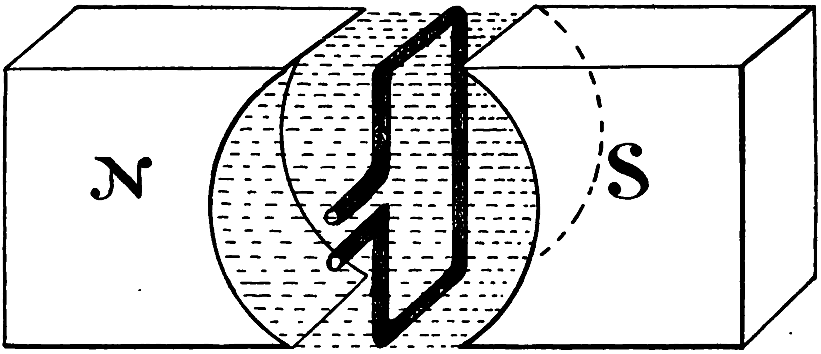


Fig. 4

The wider the neutral zone the more flexible the machine will be. Its magnetic field will be more flexible and the machine will therefore the more readily automatically adjust itself for sudden, excessive or widely varying demands. A sensitive magnetic field very quickly and very forcibly asserts itself by excessive flashing at the brushes. Sometimes, under severe conditions, such flashing will be so pronounced as to extend over the commutator from one set of brushes to another, and of sufficient intensity to open the circuit breaker or slow down an engine driving a generator. Such flashing has been termed *bucking*, and is generally equivalent to a short circuit.

In the case of large generators, hand wheel adjusting devices are provided for the purpose of shifting the large number of brushes supported from the brush holder rings. The smaller sizes of generators and motors have their brush holders so supported that this shifting can be done by hand. Generally, with the smaller sizes, once the brushes are set, they can remain. The question of facilities for shifting the brushes of street railway motors is not considered in the statements heretofore made. These statements apply more specifically to shunt-wound and compound-wound motors and generators. The street railway type of direct-current motor is series-wound. Properly designed and constructed, the brushes of a series-wound direct-current motor can be placed in a fixed position and need never be shifted.

The shunt-wound direct-current motor has a field of force energized by a current which passes through coils of wire placed about the pole pieces, this current being independent of the main or armature current. A nearly uniform strength of magnetic field is therefore always present. The effects of field distortion are therefore more pronounced in this type of motor or generator than in any other form, because there is no provision made for counteracting the effects of armature reaction. The armature reaction in the shunt-wound direct-current generator does more than affect the commutation at the brushes. It will cause the voltage delivered by the generator to drop as the load upon the machine increases. The speed of rotation of the armature of the shunt-wound motor will increase somewhat as the load upon the motor increases. The compound-wound motor and the compound-wound generator are designed to overcome these features, where their presence would be detrimental to desired operating characteristics.

The compound-wound motors and generators retain the principles of the shunt-wound machines, but in addition a separate set of coils are added to the field poles. These coils are smaller in size than the shunt coils and have a smaller number of turns of wire in them, but the wire is of much larger size. It is larger wire because the total current strength passing through the armature also passes through the series coils of the compound-wound field. Fewer turns of wire can be used in the series coils, because the strength of current flowing through the series coils is so much greater proportionately than that flowing through the shunt coils.

The shunt coil field winding produces the initial and nearly uniform magnetic field. Any current flowing in the armature circuit also flows through the series coils of the compound-wound field. The current flowing through the series coils also produces, by induction, lines of force which pass through the pole pieces and magnetic circuit of the machine. The number of magnetic lines of force which the series coils will induce will depend upon the current strength flowing through them, and the number of turns of wire of which the series coils are composed. Since the strength of this current is the same at all times as that passing through the armature circuits (the armature circuits and the series field coils being connected in series with one another), it follows that the strength of the magnetic field produced by the series coils will depend upon the load upon the machine. Therefore, when the machine is running light, the series field winding is not adding many lines of force to the main field. At this time, also, the armature current is relatively small and the consequent armature reaction distorts the main field but a small amount. As the load increases upon the machine the strength of the current flowing through the armature circuits increases, and the magnetic field created by the shunt coils tends to become distorted as previously described and illustrated. The same increasing current of the armature, however, also passes through the series coils of the machine and greatly increases the strength of the series magnetic field, thereby building up the field created by the shunt coils (which was becoming distorted and weakened) by an amount equal to what the shunt field would have lost if the series coils were not present. This is what has been termed compounding in motors and generators.

The degree of compounding can be fixed by design. The compound-wound generator can be over-compounded, i. e., they can be so designed that as the load increases upon the generator the series field coils add enough lines of force to the magnetic field to not only overcome the armature reaction, but to increase the total number of magnetic lines of force sufficiently to cause the generator to deliver a higher voltage as the load upon the machine increases. The voltage of direct-current generators is usually 500 or 550 at no load. As the load upon the generator increases from no load to full load the voltage delivered by the machine will increase from 500 to 550 or 550 to 600 or some other range as may be desired. This range of voltage is adjustable in the same machine within certain limits, but when adjusted to a definite range the machine automatically maintains that range.

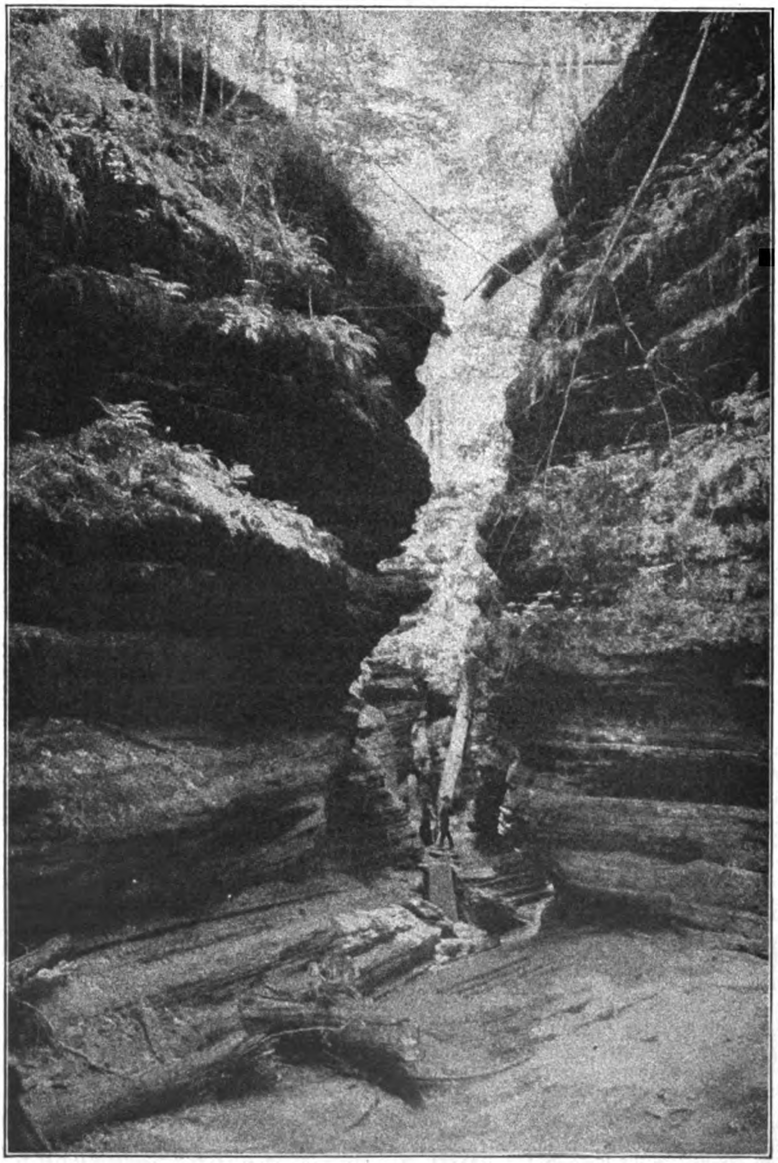
The tendency of the compound winding on compound-wound direct-current motors is to bring about sparkless commutation by neutralizing the field distortion and to cause the motor to operate at a more nearly uniform speed for varying loads. Compound-wound motors are principally used for elevator work and have very few other uses. They are generally special types.

The series-wound direct-current motor is universally used for street railway work. Such motors present altogether different characteristics from the types just described. They are the only type of direct-current motor suited to electric traction. They have but the one set of field coils. These are connected in series with one another and with the armature. There being no shunt field coils on this type of motor, a magnetic field across the poles and through the armature can only be created when a current flows through the armature. Consequently the strength of the magnetic field will vary through a range almost exactly proportional to the load put upon the motor. When the load upon the motor is light the current through the armature is small, and since the same current traverses the field coils, it follows that the magnetic field created by such a current will be correspondingly weak. The increase of load upon the motor causes a greater current to pass into the armature circuits and through the field coils, with the result that the magnetic field becomes proportionately stronger.

The primary result of such working is that, as the load upon such a motor increases the strength of its armature field and the main field are both increasing proportionately and, with this relative increase in field strength, the turning moment of the armature, or, more properly, the torque, keeps increasing at the same rate. Such motors will start much better under a heavy load and will come up to speed more quickly than will the shunt or compound-wound types.

The neutral zone of the series-wound direct-current motor is approximately constant under all conditions of load. This is also because the armature and field coils are connected in series with one another, the same current passing through both simultaneously. While increasing armature currents would tend to distort the main magnetic field, the same current in going through the series field coils in increasing strength builds up the main field sufficiently to overcome the effects of any armature reaction. The brushes on a street railway motor are, for this reason, fixed in position and cannot be moved. If heavy sparking occurs at the brushes of such a motor it is because of some other difficulty than field distortion, and a mere shifting of the brushes would not relieve the situation.

The speed at which any prime mover, such as a motor armature, revolves is a direct factor of the horsepower which such a unit develops. The starting of a railway motor is always done at a lower voltage than the line voltage. This voltage is then gradually increased to the motor, causing the motor to gain speed. In the beginning, the armature current is relatively large and the relative field strengths powerful. So long as these field strengths are maintained, the motor armature will acquire a maximum speed for such conditions and retain that speed if the voltage delivered remains the same. As the load decreases, however, the armature will increase in speed very rapidly, and should the load fall sufficiently low for any reason the armature will attain a dangerously high rate of rotation. If the motor were accidentally disconnected from the car gearing, the armature would almost immediately reach such a rate of rotative speed that it would fly to pieces. This would be caused by the rapid decrease in the strength of armature current by virtue of the decrease of load upon it; and this would mean that the strength of current flowing through the series field coils having decreased in the same ratio would leave a relatively weak armature and main magnetic field. Therefore, if it is desired to test a railway motor when removed from a car truck, provision must be made to load it down with some sort of a brake or equivalent device.



COLD WATER CANYON—THE DELLS, KILBOURN

(Courtesy Chicago, Milwaukee & St. Paul Railway)

Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

710. Link Motion.—"The following statement is not entirely clear to me: '(a) The angularity of the main rod increases the lead in front and decreases it behind. (b) These defects are overcome by backsetting the saddle pin.'

"To make the point in question clear, will describe briefly the effects such errors have on the crank, link and valve as I learned from a description of link motion. (a) Angularity of main rod, which makes it impossible to exactly place piston in center of cylinder when main crank pin is on exact quarter, or, in other words, to have piston central. The crank pin during rearward movement of piston lags behind its correct position, which the eccentric and link will do also, and cut-off will be too late on rearward stroke, or forward port (indirect motion). During the forward stroke of piston the crank pin runs ahead of its correct position, which the eccentric and link will do also, and cut-off will take place too early on forward stroke, or back port. To correct this error, i. e., to have cut-off equal front and back, the link saddle pin must be placed at a certain distance outside the link arc.

"Therefore, it is obvious to me why the angularity of main rod retards the cut-off and exhaust in front and hastens each behind, but it is not clear why the lead is increased in front and decreased behind.

"Now, stopping to think, I cannot understand how it is possible for the angularity of main rod to vary the lead, as lead is calculated at the dead center, at which point there is no angularity of main rod because of it being at a minimum, or zero.

"I think probably this increase of lead in front and decrease of lead behind is caused by the angular vibration of the eccentric rods, and, for the reason that they are in the same condition as the main rod, are included, for simplicity or some reason, in the statement 'Angularity of main rod,' although I am not certain. This is one of the points in question. Please explain. If the variation of lead, as above stated, is caused by the vibration of the eccentric rods, state how.

"Will now refer you to the latter part of the statement: '(b) These defects are overcome by backsetting the saddle pin.'

"The description of link motion which I have, states that the saddle pin must be placed outside the link arc to overcome the defects, namely, angularity of main rod and that due to the vibration of eccentric rods, if this be its purpose to overcome these defects or errors.

"Notice the difference: one calls for the saddle pin to be backset, while the other calls for placing the saddle pin outside of link arc. This is what I do not altogether understand.

"I can see through this question if the following statement is correct, which I think results in the final offset being backset of the link arc.

"The statement is this: I find in the description of link motion that the error due to the location of the eccentric rod pins back of the link arc overrides the main and eccentric rod errors, and requires that the saddle pin be backset of link arc to correct the error due to the eccentric rod pins back of the link arc. From this it is obvious that the main and eccentric rod errors are to some extent, a corrective factor, as they partly correct the error due to the location of eccentric rod pins back of the link arc, but not entirely, and the remaining backset of saddle pin is for the purpose of correcting the remaining part of the error of the eccentric rod pins back of the link arc.

"Now, from this, that the final offset results in backsetting the saddle pin back of the link arc, I base my opinion that for some reason the statement, 'these defects (of main and eccentric rods vibration) are overcome by backsetting the saddle pin,' was taken. Is my opinion correct? I have done some thinking on this question."—*N. L. K.*

Answer.—If you will refer to question 561, "Location of Saddle Pin," page 205 of the February, 1908, issue, this question will no doubt become more clear to you. As stated on page 206 and referring to Fig. 3, which shows the angularity of the main rod, it will be seen that the crank pin in its travel from the back center to the top quarter, moves a lesser distance than from the top quarter to the forward center, and consequently the movement of the piston is likewise less. The wheel rotates at the same velocity throughout the stroke, but as the piston travels a lesser distance from the back center to the top quarter, it is plain that its movement must be slower between these two points than from the top quarter to the forward center and, as the ecentrics are connected to the axle and derive their movement from it, the speed of this movement is necessarily the same throughout the entire revolution. It therefore follows that some provision must be made to decrease the speed of the valve while the piston is traveling from the back center to the upper quarter, and to increase the speed of the valve while the piston is traveling from the upper quarter to the forward center, or from the forward center to the bottom quarter, otherwise we would get an unequal distribution of steam in the cylinders. This increase and decrease in the speed of the valve is effected by setting the link saddle stud back of the link arc; the amount of the backset depending almost entirely upon the angularity of the main rod. The angularity of the eccentric blades also enters into the problem, but the correction is almost entirely made by means of the saddle stud alone. Understand that the speed of the valve is increased and decreased simply by increasing and decreasing the travel during certain portions of the stroke, which variations in travel are accomplished automatically by locating the saddle stud as above stated.

By referring to Figs. 1 and 2 (Question 561), you will see that the link is automatically raised and lowered in its relation to the rocker-arm pin, and this raising and lowering of the link is increasing and decreasing the travel of the valve correspondingly, as the travel of the valve must be increased and its speed likewise increased while the piston is traveling from forward center to lower quarter when the engine is backing up, or from the forward center to the upper quarter when the engine is backing up, and as the forward and back movement of the valve is effected during a portion of the stroke only, it is plain that after leaving the forward center the port opening or lead will increase more rapidly than it will when the piston is leaving the back center.

If you will take Figs. 1 and 2 referred to as shown in February issue, and rotate them so that the crank pin will be at either forward or back center, you will note that one eccentric will be above the pin while the other will be an equal distance below it. This will practically plumb the link so that the points *E* and *F* will coincide. If the engine were now moved in a forward direction and the crank pin were on forward center, the first effect would be a downward movement of the link on the block. This movement is generally termed "the slip of the link," and can readily be noticed by watching the link's action from the running board of the engine when running. This downward movement of the link increases the travel and, of course, during that portion of the stroke likewise increases the speed of the valve. Reversing the proposition by placing the crank pin on back center, the link is tilted into the opposite direction, thereby virtually raising it so as to shorten the cut-off and consequently the port does not open as rapidly as it did on the forward center.

Your ideas of the angularity of the main rod, as stated in the third paragraph of your question, are correct, and we trust that the explanation given will show you how the lead is increased in the front and decreased at the back center. We would suggest, however, that you study the diagrams and answers to question 561, above referred to, carefully.

Replying to that portion of your question in which you state that you cannot understand how it is possible for the angularity of the main rod to vary the lead, etc., would say that you are absolutely correct in stating that the lead is calculated at the dead centers, at which point there is no angularity of the main rod. When setting the eccentric, in order to give the definite amount of lead on either center the angularity of the main rod is not taken into consideration, as it has been assumed that the effects of the angularity of the main rod have been corrected by the location of the saddle stud beforehand. Therefore engines are set with definite lead on the dead center in full gear, but after the crank pin leaves dead center the main rod begins to assume a certain angle and consequently the lead, for reasons given above, will increase more rapidly when the piston is leaving forward center than when leaving back center, and it is doubtless this increase in lead that the authority you quote refers to. The increase and decrease in lead is not caused by the angular vibration of the eccentric rods, although, as stated before, their angularity also enters into the problem.

In regard to the difference which you note in the two authorities quoted, one stating that the saddle pin must be placed outside of the link arc and the other overcoming it with the saddle pin by the backset, it is possible that you were in error in reading this, as the first authority quoted might have stated that the saddle pin should be set outside of the chord of the arc, which would be the same as the backset. The chord of the arc being a line drawn through a part of a circle, as, for instance, in Figs. 1 and 2, the lines *G G* show the chord of the arc of the link. Your opinion as stated in the latter part of your question, namely, that the error due to location of the eccentric rod pin, etc., necessitates the saddle pin to be backset, etc., is correct.

We note from the reasoning in your question that you must have given the matter considerable thought, and would suggest that an easy solution of this problem for you would probably be the valve motion model, or, in case you have no access to something of this nature, would suggest that you cut one out of cardboard and notice the movements of the link. Even a link alone cut out of a piece of cardboard and oscillating it on a pin center, letting this center represent the saddle pin and locating it at some distance back of the center of the link, will give you a good idea of the way the link moves up and down on the link block during the various portions of the stroke.

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711. Right and Left Lead Engines.—"Please give some rule to distinguish a left lead engine from a right lead engine, or vice versa."—*J. L. D.*

Answer.—A right lead engine is one in which the right crank pin leads the left crank pin, that is, if the right side is on forward center, the left side should be on top quarter. If the left side, however, is on the forward center when the right side is on the top quarter, it is a left lead engine.

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712. Reducing Resistance to Horsepower.—"We find that there is so much train and grade resistance to get a certain train up a hill. How can I reduce this to horsepower?"—*Member.*

Answer.—Grade resistance is figured in terms of tractive power, as the question of time enters into all horsepower calculations, and not into the tractive power calculations. For instance, in speaking of tractive power we mean the weight that the locomotive would pull out of a well without any reference to the time it would take, as, for instance, if the locomotive developed a tractive power of 33,000 pounds, it would pull a weight of 33,000 pounds out of a well without reference to the time; figured in terms of horsepower, however, it would mean that the same locomotive would have to raise this weight of 33,000 pounds one foot in each minute; therefore, to reduce the grade resistance to horsepower it is first necessary to find the total weight or tons of train that the locomotive in question would take up a certain grade at a certain speed, then calculating the tractive effort of the locomotive at that speed it would give you the tractive power developed; this multiplied by the speed in miles per hour and dividing by 375, would give you the horsepower that the locomotive would exert in order to overcome the grade resistance with a certain amount of tonnage.

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713. Horsepower of Locomotives.—"In the June issue of the Magazine the question was asked as to how to figure the horsepower of a locomotive of the following dimensions: Cylinder diameter 22 inches, length of stroke 28 inches, 200 pounds boiler pressure, drivers 56 inches in diameter, speed 25 miles per hour, by the following formulas:

$$\frac{P\ L\ A\ N}{33{,}000} \text{ and } \frac{\text{Tractive Power} \times \text{Speed,}}{375}$$

and both figured out 1774 H. P. However, in October Magazine the question was asked when figuring by the foregoing formulas how the M. E. P. was arrived at, and you referred to a chart which gives 47½ pounds M. E. P. at 25 M. P. H., instead of 55 per cent. of boiler pressure, as stated in June Magazine. By using as M. E. P. 47½ pounds instead of 55 pounds, there is a difference of 242 H. P., nearly, between the result of the two formulas: Can you explain?"—*Member.*

Answer.—If our correspondent will read the concluding paragraph in answer to question 656 on page 566 of the October, 1908, issue, he will find that it stated that the error was made in the example given in the June number by following the wrong line, and that the mean effective pressure should have been stated as 47½ per cent. of 200 instead of 55 per cent., and if you will also refer back to answer to question 599, page 834 of the June issue, you will see where it is stated that in calculating tractive power of a locomotive by the speed, the mean effective pressure must be used instead of 85 per cent. of the boiler pressure (which percentage is commonly used in calculating a maximum tractive power of a locomotive), therefore 47½ per cent. of the boiler pressure should have been used in both formulas instead of 55 per cent., which would give you the same answer where $\frac{P\ L\ A\ N}{33{,}000}$ is used, or the formula, $\frac{\text{Tractive Power} \times \text{speed,}}{375}$ is used, being careful in calculating the tractive power when calculating for speeds to use the mean effective pressure for that speed as determined from the chart shown in the October, 1908, issue, and not 85 per cent. of the boiler pressure. The method of arriving at the solution of the problem given in question 599 of the June issue was correct. The only error was the one acknowledged in the October issue, viz., that the wrong mean effective pressure was used.

714. Ratio of Grate Area to Cylinder Volume.—"What is the usual proportion of grate area to cylinder volume of yard engines and road engines?"—*Member.*

Answer.—This varies considerably, according to the ideas of the designer, and, if you will note, ratio as published in the technical journals on each class of engines built for different railroads, you will readily see that there is quite a difference of opinion as to the proper proportions to be used. The commonly accepted ratio of cylinder volume to the grate area of yard engines is from 2 75-100 to 3 5-10, while on the latest type of road engines it is from 3 75-100 to 5.

715. Regulating Draft in Front End.—"To increase the draft with the convey pipe, shouldn't the pipe or lower part be raised and the sleeve or top part lowered, so that there would be a greater opening between top of sleeve and base of stack, also between the top of exhaust pipe and bottom of convey pipe?"—*Member.*

Answer.—Yes, but this can be carried too far. That is, the convey pipe can be raised too much and the sleeve lowered too much to obtain good results. The object of the convey pipe with the sleeve is to obtain an equal distribution of draft over the entire grate area, as, for instance, with a diamond stack engine having no diaphragm plate; if it was desired to increase the draft at the back of the firebox the sleeve would be lowered, and contrary-wise the pipe would be raised; if it was desired to increase the draft next to the flues, when engine is equipped with a diaphragm plate, however, a straight stack and extension front, the distribution of draft is usually regulated by means of the diaphragm plate, but it can be modified to a certain extent by means of the convey pipe. In this case, however, exactly the opposite obtains in that if it is desired to increase the draft at the forward end of the firebox by means of the convey pipe only, and without disturbing the diaphragm plate, the sleeve of the convey pipe should be lowered.

716. Horsepower of Locomotives.—"On page 565 of the October, 1908, issue of the Magazine, question 653, 'Horsepower of Locomotives,' some one asks if a light engine running at 40 miles per hour would exert the same power as one running the same speed with 1,000 tons. Your answer is: 'If both engines were of the same size, etc., each would be developing the same horsepower.' I think your answer is wrong, and the engine when loaded to 1,000 tons would be working with longer cut-off and more throttle, and would have much greater mean effective pressure in the cylinders than the light engine, and would therefore be developing a greater horsepower."—*E. McB.*

Answer.—In answering the question it was assumed that both engines were being worked at the same point of cut-off, and with the same amount of throttle, in which case each one would be developing the same horsepower. Of course if the engine handling the 1,000 tons was being worked in a longer cut-off, it would, as you say, have a higher mean effective pressure in the cylinders, and therefore the horsepower developed would be greater.

717. Draft Appliances.—"Will you please say through Questions and Answers Department of Magazine what is the correct size of petticoat pipes for engines with Master Mechanic's front end, cylinders 20 x 26 inches and 21 x 28 inches; also usual practice for distance between top of pipe and smoke arch center, between top of exhaust tip and bottom of pipe, and when two pipes are used, distance between?

"In speaking of the size it is meant the diameter. Would like to see a cut of front end, along with any information obtainable."—*F. K. C.*

Answer.—While the Master Mechanic's Association fixed a standard form of front end, petticoat pipes, etc., they did not confine their recommendations to any particular size, and, therefore, there is quite a wide variation, governed by local conditions, the character of fuel used, etc. As a rule, however, engines having 20 x 26-inch cylinders with single pipe, generally use 12-inch petticoat pipe. A 12½ or 13-inch is used in 21 x 28-inch engines. With a single pipe, the usual practice is to set the bottom of the pipe about 2½ to 3 inches above the nozzle tip, the top of the pipe being generally set twice as far below the smoke arch as the bottom of the pipe is set above the tips, or, in other words, where the bottom of the pipe is set 3 inches above the nozzle tip the top of the pipe would be 6 inches below the arch. Some railroads where, on account of the excessive height of the boiler and the low clearance limits of bridges, tunnels, etc., a short stack must be used, the petticoat pipe virtually becomes an inside extension of the stack. That is, the top of the pipe is pushed into the bottom of the stack, forming a perfect joint, and is then extended down into the smoke arch a distance of about 9 inches above the exhaust nozzle. (See Fig. 1.) In other cases it is extended down from 12 to 13 inches inside of the arch and a short petticoat pipe used in connection with it. In this case the petticoat pipe is usually set about 3 inches above the nozzle of the tip and about 2 inches below the inside extension. (See Fig. 2.) Where double pipes are used the top of the upper pipe is usually set about 2 inches below the smoke arch, the top of the lower pipe about 1 inch below the bottom of the upper pipe, and the bottom of the lower

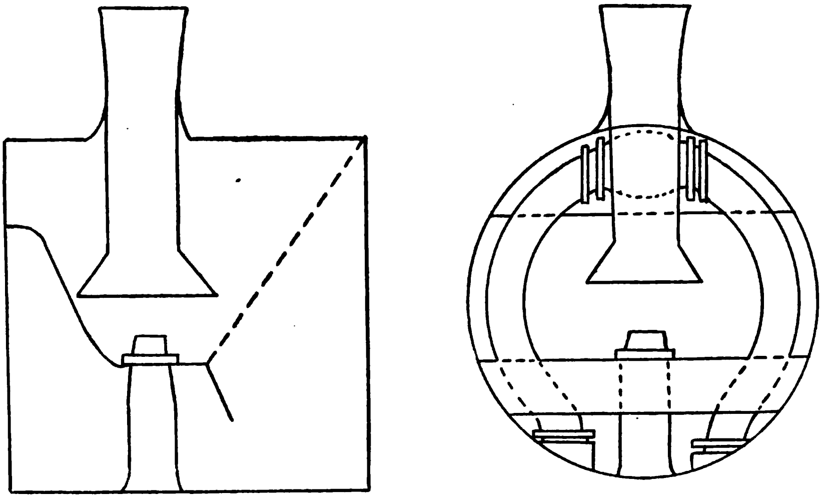

Fig. 1. M. M. Standard with Inside Extension

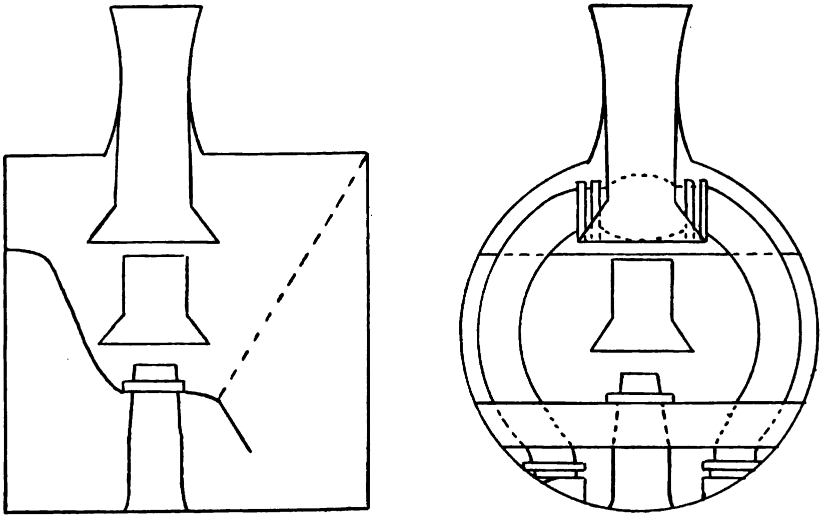

Fig. 2. M. M. Standard with Inside Extension and Short Petticoat Pipe

pipe set from 2 to 3 inches above the nozzle. In this case the top pipe is made about the same diameter as the choke in the stack, the lower pipe being usually 2 inches less in diameter. Fig. 3 is an illustration of this type of front end. Fig. 4 is an illustration of the Master Mechanic's Standard front with single pipe. The distance the petticoat pipe in either type of front end is set above the nozzle and below the smoke arch depends considerably on the manner in which the engine is handling her fire, or in which the draft is distributed over the grates. As where the draft cannot be further regulated or distributed by means of the diaphragm plate, on account of the front end filling up with cinders, it is customary to make further adjustment by means of the petticoat pipes.

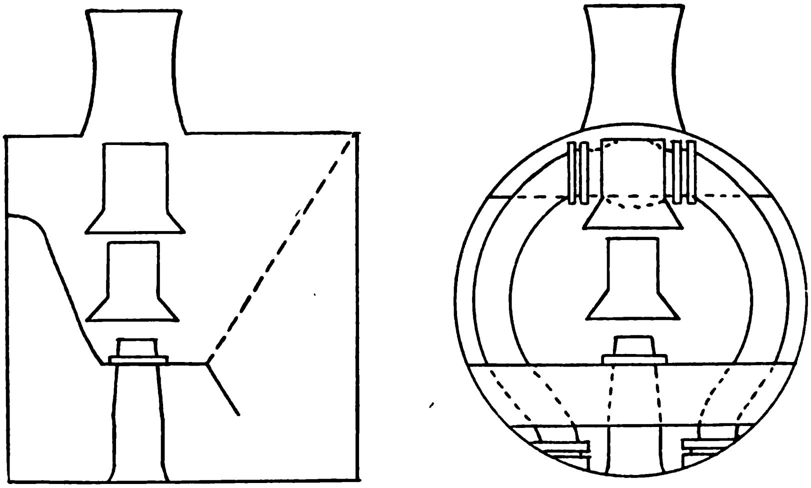

Fig. 3. M. M. Standard with Double Lift Pipe

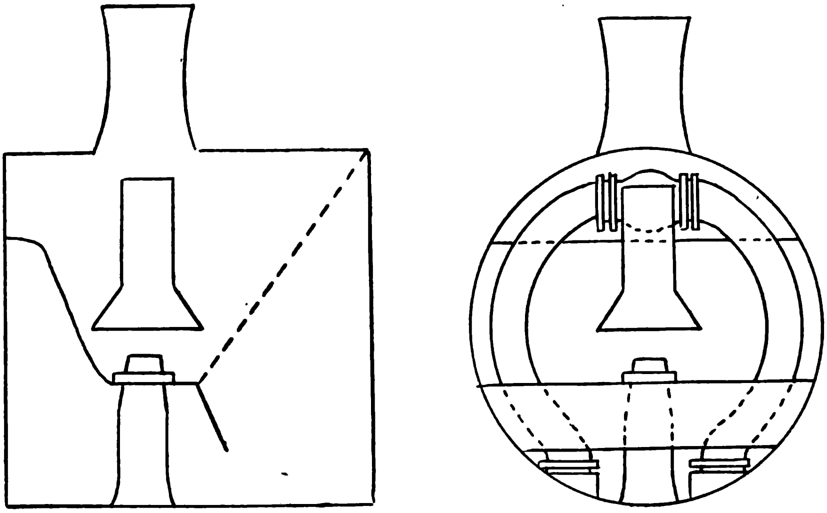

Fig. 4. M. M. Standard with Single Lift Pipe

The Westinghouse Air Brake.

Answers by F. B. Farmer.

426. Automatic Slack Adjuster.—"Describe the McKee slack adjuster. What is its advantage over hand adjustment?"—*J. H. L.*

Answer.—The device referred to is that now known as the "American Automatic Slack Adjuster." As applied to passenger equipment cars it is attached to the pressure head of the brake cylinder, this being the head opposite the one the piston rod extends through.

The end of the cylinder lever that is otherwise fulcrumed on the pressure cylinder head, is now connected to the crosshead of the automatic slack adjuster. The latter takes up the slack or, speaking more correctly, shortens the piston travel, by its crosshead pulling the end of the lever *away* from the brake cylinder. And whatever this movement the piston travel is shortened exactly the same amount.

The slack adjuster crosshead is on the end of a threaded rod which extends through a hole in the free end of the slack adjuster body. A ratchet nut screws on the threaded rod and, by bearing on the end of the adjuster body, draws the rod and crosshead, with the end of one cylinder lever, away from the brake cylinder. The ratchet nut has a hollow extension into which the rod enters as slack is taken up, the rod being thereby protected from injury.

The slack adjuster is automatic alone in taking up slack. It must be let out by hand, by turning the ratchet nut backward, so as to move the crosshead toward the brake cylinder. In taking up slack automatically the ratchet nut is turned by a pawl having a hooked end that engages the teeth of the ratchet nut. This pawl is on the end of the piston rod of a little air cylinder, one very similar in construction to a brake cylinder.

The slack adjuster cylinder has a small pipe that taps into the side of the brake cylinder at the point where it is desired to regulate the piston travel, ordinarily 8 inches. When the brake cylinder piston travels beyond this the pressure acting on it also enters the slack adjuster cylinder, moves its piston, compresses the piston spring and moves the pawl over two teeth of the ratchet nut, the latter having fifteen teeth. When the brake is released the air in the slack adjuster cylinder escapes out of the nonpressure brake cylinder head as soon as the brake cylinder piston moves back of the pipe connection. The slack adjuster piston spring then gives the ratchet nut a partial turn and unhooks from it, the object of the latter operation being to permit of turning the ratchet nut back when it is desired to let out slack, as when applying new brake shoes.

Each operation of the slack adjuster shortens the piston travel one-thirtieth of an inch. Stated differently, it requires thirty operations to shorten the piston travel one inch. One turn of the ratchet nut makes one-fourth inch difference in piston travel. After changing brake shoes adjust the piston travel to about 7 inches by hand. The automatic slack adjuster will then make it exactly right and keep it so.

The advantage over hand adjustment is twofold. First, no hand adjustment can get piston travel right to start with for the reason that it is the *running* piston travel that should be regulated, because it always *exceeds* the standing travel and because the difference between the two varies with different cars and, on the same car, with different brake applications. The greatest difference on the same car is between that resulting from a light brake application at slow speed on an ascending grade and the piston travel that follows from a heavy application made at high speed and requiring a long distance for the stop, as down a steep grade. The other reason is that nothing but an automatic device will take up the slack just as the brake shoes wear and at exactly the amounts needed.

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427. Westinghouse 8½-inch Cross-Compound Pump.—"Please explain the operation of the Westinghouse cross-compound pump and advise how this pump compares with the New York No. 5 pump."—*J. H. L.*

Answer.—The cross-compound pump consists of two air cylinders, cast together, secured by a center piece to two steam cylinders, also cast together, and a valve motion in the top steam cylinder head. The 8½-inch diameter or high-pressure steam cylinder operates the 14½-inch diameter or low-pressure air cylinder, and the 14½-inch diameter or low-pressure steam cylinder operates the 9-inch diameter or high-pressure air cylinder. The stroke is 12 inches.

Atmospheric pressure enters the low-pressure air cylinder only and is compressed from it into the high-pressure air cylinder, giving 40 pounds in the latter. The high-pressure cylinder then raises this pressure slightly above that in the main reservoir, into which it is then discharged.

The steam from the high-pressure cylinder, after having compressed the air from the low into the high-pressure air cylinder, is exhausted into the low-pressure steam cylinder where it finishes the air compression in the high-pressure air cylinder, as previously explained, and is then discharged to the atmosphere.

The valve motion is actuated by the high-pressure steam cylinder piston and by means of the familiar reversing valve, rod and plate of other Westinghouse pumps. These operate a piston valve that (1) admits the steam from the boiler to the high-pressure steam cylinder, (2) from the high to the low-pressure steam cylinder, and (3) from the low-pressure steam cylinder to the atmosphere.

This cross-compound pump compresses air as rapidly as three 9½-inch pumps, but in compressing the same amount of air it uses about one-third as much steam. It has a greater air capacity and steam economy than the New York No. 5 pump.

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428. Standard Brake Pipe Pressure.—"Why is 70 pounds the standard train pipe pressure? Why not 80 pounds or 90 pounds?"—*J. H. L.*

Answer.—While the writer has never been authoritatively advised why 70 pounds was originally adopted as the standard brake pipe pressure, the following reasons seem to be adequate.

First, a much lower pressure would produce greater shocks in an emergency application, due to quick action being slower. Second, the service application would be slower, and a lesser reduction would fully apply the brakes, both of which would increase the difficulty of doing good braking.

On the other hand, high pressure means more heating and wear to air pumps, more steam used, greater leakage and harder work for all valves used in controlling the compressed air. Hence, for general service 70 pounds appears to be the "happy medium" that avoids these undesirable results.

Understand, though, that there are roads where it is not standard, as on those using the old high-speed brake where 110 pounds brake pipe pressure is standard. Some others use 70 pounds in freight service except down steep grades, where 85 pounds or 90 pounds, even as high as 100 pounds, is carried.

But even on such roads it is customary, with rare exceptions, to base the car and driver brake leverages on the brake cylinder pressure obtained from 70 pounds brake pipe pressure. Where this is done and cars are braked to the same per cent. of their empty weight the result of raising or lowering the brake pipe pressure will be the same on all, even though from different roads.

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429. Difference Between No. 5 and No. 6 ET Equipments.—"What is the difference between the No. 5 and the No. 6 ET eqiupments?"—*J. H. L.*

Answer.—With helper engines, or any not in control of the brakes, the handle of the automatic brake valve is carried on lap with the No. 5 and in running position with the No. 6 ET, the brake valve cut-out cock, or double-heading cock as it is now termed, being closed in either case, as with older types of brake valve.

The handle return spring of the independent brake valve is more substantial with the No. 6. It also aids the engineer in locating the slow application position. However, the same spring can be applied to the No. 5 independent brake valve.

In running position of the automatic and the independent brake valves the application cylinder of the distributing valve remains open to the atmosphere with the No. 5 when a brake pipe reduction is made elsewhere, as from a back-up hose, a break-in-two or a burst hose, but is immediately closed with the No. 6. With the former no considerable braking power can then result until one or the other brake valve handle is moved to some position to the right of running, but with the No. 6 and, say, a burst hose, full service braking power will at once be had on the driver and tender brakes. Each has its advantage over the other.

With the No. 6 an excessive service reduction will not increase the brake cylinder pressure above the equalizing point of full service application, but will with the No. 5. However, the latter can easily be made to operate the same as the No. 6 in this particular.

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430. Braking Power for Drivers.—"How much braking power should a driver brake have?"—*J. H. L.*

Answer.—This depends on the apparatus operating it and on the service the locomotive is usually engaged in. With ET equipment, with which the emergency braking power is greater than the full service power, a higher maximum braking power is practicable than otherwise.

Uniform reduction in speed throughout a train and avoidance of jerks and bumps from slack running in or out will allow of a higher braking power without danger of wheel sliding. Hence, a higher power may be safely used with passenger than with freight locomotive driver brakes. It is also desirable.

Again, a driver brake is more effective when the direction of wheel movement tends to lift instead of pull down on the brake shoes. Hence, on a road engine with brake shoes at the rear of the drivers the maximum power can and should be a little lower than with shoes ahead of the drivers.

These features are mentioned to show the difficulty of applying a hard and fast rule, and the advantages resulting from the experience of those who are regularly engaged in designing locomotive driver and engine truck brakes. Speaking generally, the writer prefers that each pound of brake cylinder pressure shall give about one per cent. braking power for freight and switching locomotive driver brakes, and 1 1-6 per cent. for passenger locomotive driver brakes *where ET equipment is used.* Stated differently, this means that freight and switching locomotives with ET apparatus should be braked at about 60 per cent. on drivers, and passenger locomotives 70 per cent., all based on 60 pounds brake cylinder pressure.

With other types of locomotive brake equipment 50 pounds brake cylinder pressure is used as maximum in designing driver brakes. While it increases the liability of sliding drivers in service applications, yet safety in emergencies demands that the percentage of brake power to weight on drivers be about the same as specified for ET. As a matter of fact, the maximum with ET can be increased with safety where the other equipments give no trouble from sliding when braked as mentioned.

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431. K Triple Valve.—"Please describe the K triple valve and state what advantages are claimed for it."—*J. H. L.*

Answer.—In "emergency" or quick action operation the K triple is exactly the same as the older or H type. In fact, all of the lower or emergency parts in the two types of triple, as now made, are interchangeable.

The advantages of the K triple are that in service applications it stops trains quicker, with less air and less shock than the older or H type, and permits of releasing the brakes on long trains at low speed without shock or damage, impossible with the H triple. While it is most advantageous with very long trains, such as 50 or 100 cars, yet it is still much superior and very valuable on shorter trains. Down steep grades it produces a large increase in safety, the most recent demonstrations of this being those of last summer on the S. P. Co.'s lines, where on Beaumont Hill the train tonnage was increased from 2,000 to 3,000 and the weight per good brake, being what each brake had to hold, was raised from 110,000 pounds to 182,800 pounds. On Siskiyou Mountain, down a grade 174 feet per mile, the weight per good brake was raised from 80,000 pounds to 145,270 pounds with a train of 18 loads and one empty; total tonnage back of engine, 1,395.

The safe release at low speed saves time and damage. Yet another advantage is that a mixture of half K and half H triples will effect an improvement in stopping that is not far from that of all K triples. Finally, the design of the K triple is such that the H triple can be converted to a K with little loss of parts and at a very reasonable expense. The K1 and K2 triple valves differ only in size, as do the H1 and H2. K1 and H1 triples are interchangeable and are used with 8-inch cylinder freight brakes. K2 and H2 triples are interchangeable and are used with 10-inch cylinder freight brakes.

The improvement of the service application by the K triple is due to its making the reduction *quicker*, yet more uniform throughout the train. This is because each triple valve aids the brake valve in making the reduction by letting brake pipe air flow into its brake cylinder. In fact, it is a modified quick action, one that quickens the brake pipe reduction, yet allows the engineer to control the amount of reduction. This feature requires no more parts than in the H triple, merely different porting and a slide type of graduating valve.

Ability to release long trains at low speeds is due to what is known as the "uniform release" feature. While the brakes near the locomotive *commence* to release before the rear ones, which is a cause of break-in-twos with the H triples, they release slower for 25 to 30 cars back than do those beyond. Hence, while the latter *start* last they soon catch up and release with or quicker than the head brakes.

This retarded release of the head brakes is due to the rapid rise of brake pipe pressure near the locomotive. As far back as it rises rapidly the triple valve slide valves are pushed beyond the position where they make the normal opening of the exhaust port, to a position where this port is very small. To do this requires that the triple valve main piston shall compress a spring similar to the graduating spring, but acting in release movement. It is in a cage or housing that extends into the auxiliary reservoir.

About 25 or 30 cars back from the engine is as far as the triples are ordinarily moved to retarded release position. Beyond that the spring mentioned stops each valve in normal release.

Yet another advantage results from the restricted recharging in retarded release. That is, it is made enough slower, due to feed groove restriction, to cause the head brakes to charge at about the same rate as those farther back, where the brake pipe pressure rises slower. This restriction at the head end causes a quicker recharge at the rear and very materially reduces the tendency of head brake to reapply after the brake valve handle is moved from release to running position. To accomplish the foregoing results requires no new method of handling on the part of the engineer, but merely to follow old instructions.

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432. Ten-Pound Reduction from 70 Pounds or 110 Pounds Brake Pipe Pressure.—"Is a higher brake cylinder pressure obtained with a 10-pound reduction from the brake pipe charged to 110 pounds than when 70 pounds pressure is used? If not, why not?"—*J. C.*

Answer.—With short trains, no. With long freight trains, particularly those with any other than the K triple valve, there is a little difference in favor of the 110 pounds pressure, due to the reduction taking place a little faster over that portion of the train near the brake valve. Where the reduction is very slow there is liable to be some little auxiliary reservoir pressure flow back through the feed grooves into the brake pipe, instead of going to the brake cylinder. Next, there is sure to be a loss through the brake cylinder leakage grooves as the very gradual admission of auxiliary reservoir pressure to the brake cylinder forces the piston of the latter to move slowly past these grooves.

Where the brake pipe is short enough to insure a prompt reduction of brake pipe pressure the brake cylinder pressure obtained from a 10-pound reduction will be the same from either 70 pounds or 110 pounds pressure, piston travel being the same and the brake cylinders being free from leakage.

The reason for this is that the same amount of air, considering both volume and pressure, must be discharged from the auxiliary reservoir to reduce its pressure 10 pounds, whether from 70 pounds or 110 pounds. Consequently, as we are considering a reduction of 10 pounds in both cases, the brake cylinder will receive exactly the same amount in each case and will, therefore, have the same pressure.

Another way to state this is that if we could take all of the air obtained in the brake cylinder by a reduction of 10 pounds from 70 pounds in brake pipe and auxiliary reservoir, and compress it into another similar auxiliary reservoir already charged to 100 pounds, it would raise its pressure to 110 pounds.

The following may aid in making this plainer. We will assume an auxiliary reservoir that has 1,640 cubic inches volume. When it is what we ordinarily term "empty," it actually has atmospheric pressure, 14.7 pounds at the sea level, usually considered as 15 pounds in approximate calculations. This is the pressure above a vacuum and is spoken of as absolute, in comparison with gauge pressures. Now, putting 1,640 cubic inches of atmospheric or free air into this auxiliary reservoir will mean 3,280 cubic inches in one-half the space it formerly occupied. The result will be twice the pressure of 15 pounds, or 30 pounds absolute, which is 15 pounds gauge pressure as the latter is always 15 pounds less than absolute pressure. If 4,920 cubic inches, three times that of the auxiliary reservoir, is compressed into it the volume will be reduced to one-third and the resultant pressure will be three times 15, or 45 pounds absolute and 30 pounds gauge. Compressing 9,840 cubic inches of free air into this reservoir would reduce the volume to one-sixth and raise the pressure to 90 pounds absolute, or 75 pounds gauge.

As adding another auxiliary reservoir

volume of free air (1,640 cubic inches) to whatever there was in the auxiliary reservoir, always produces the same increase in pressure, it should be obvious that discharging an equal amount in pounds, no matter from what pressure, will mean exactly the same quantity of air; hence, that if let into a brake cylinder it will produce the same pressure in each case.

It should be noted that *one-half* the *volume* gives *twice* the pressure, *one-third* the *volume* gives *three* times the *pressure* and *one-sixth* the *volume* gives *six* times the *pressure*. This will make clearer the meaning of "Mariotte's Law," as it is termed, that "The volume of a given quantity of gas varies inversely as the pressure, temperature remaining the same." This latter temperature is important. For compressing air increases its pressure and *also heats* it, and this heating makes a farther increase in pressure. Expanding air decreases its pressure and also *cools* it, and which cooling still farther reduces the pressure.

As the foregoing indicates, increasing the volume to any given amount will lower the pressure inversely. That is, if the volume is increased to three times what it was the resultant pressure will be one-third of what it was. But it must be borne in mind that in such calculations it is necessary to use absolute pressures, changing to gauge pressure only at the end of computations.

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433. K Triple Blow at Exhaust—"What causes a blow at the exhaust port of either the K1 or the K2 triple valve, and how should same be remedied?"—*J. C.*

Answer.—Just the same causes as with the older quick action type, the H1 or the H2. The commonest cause is probably a leaky emergency valve. Where so it will be indicated by the triple buzzing, due to the check valve vibrating as it lets the brake pipe air past. However, this sound does not always indicate a leaky emergency valve with a K triple, as there are many thousand of these in use that buzz when they charge and all do when applied in service. Always see if the buzzing continues after the brake is charged; also, that there is a leak at the exhaust, both of which must occur if the emergency valve is leaking. Other causes are a leaky slide valve, a leaky triple valve gasket and, which is rare, a leaky tube through the auxiliary reservoir.

All but the emergency valve are leaks from the auxiliary reservoir. To tell if it is the emergency valve, that is, a brake pipe leak, cut out the brake and bleed all air from the auxiliary reservoir. Then, cut in the brake and note quickly whether the blow at the exhaust (retaining valve) commences as strong as it was before. If so the emergency valve is leaking. Any of the other defects would cause the leak to commence light, the auxiliary reservoir being empty, and gradually increase as this reservoir charged.

The only remedy a trainman or an engineman can ordinarily employ is to make one or two emergency applications of that brake, cutting off each side of it and using the angle cock to apply if the car is far from the locomotive. The object sought is to blow off from the emergency valve seat any dirt that may have lodged there, and to work the slide valve to bring it to as good a bearing as this will. The nuts securing the triple to the auxiliary reservoir may also be tightened. If these do not stop the leak and it is from the brake pipe, the brake should be cut out and carded. If the leak is from the auxiliary reservoir and is small, the brake may be left cut in, though it will be of little or no use except in an emergency. At any rate, it should be carded.

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434. Broken Uniform Release Spring in K Triple.—"What effect would a broken retarding device spring in a K triple have?" —*J. C.*

Answer.—Like the graduating spring, there is little liability of such breakage, but if anything occurred to prevent this uniform release or retarding device spring from resisting the movement of the main piston to retarded release position it would move to this position at every release, thereby retarding the release of that brake. If it were a brake near the head end this result would have followed with the valve in good order. If it were back of the thirtieth car of a long train, where it would otherwise not go to retarded release, it would be of no consequence. While it would tend to run out the slack, yet the damage it could do would be about as much as one K triple valve at the head end of the train could save in a release at low speed, which is none.

Many freight trains have empties at the rear and short piston travel on some of such cars, much shorter than on the average loads. An attempt to release at low speed, after a heavy brake pipe reduction, will cause such rear brakes to exert a far greater tendency toward breaking the train in two than would several rear brakes with broken uniform release springs in their triples.

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435. Cylinder Pressure With K2 Triple.—"With a K2 triple how much pressure is obtained in the brake cylinder with a reduction of 10 pounds, and how much of this comes from the train pipe?"—*J. C.*

Answer.—About 20 pounds with 8-inch piston travel, being but a trifle more than any other triple would give with a short train. The important point is to obtain the quick reduction of brake pipe pressure, as this will prevent any loss through feed grooves and leakage grooves and insure the prompt and effective action of all brakes, even in the longest trains.

The amount the brake cylinder gets from the brake pipe is about as much as would stay in the brake cylinder in case its piston were prevented from returning when the triple valve was moved to release position, atmospheric pressure.

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Train Rules and Train Practice.

Answers by H. A. Dalby.

321. Wait or Not?—"Order No. 1 reads: 'Engine 726, work, 1 p. m. to 7 p. m., between A and C, and protect against extra 1300 east, after 5 p. m.' Order No. 2 reads: 'Extra 1300 east, meet work extra 726 at B.' Extra 1300 goes to B and at 7 p. m. work extra 726 has not showed up. Can extra 1300 east proceed, or must they wait at B?"—*W. C.*

Answer.—This question has been asked many times and there is nothing in the rules to answer it. The makers of the rules never intended orders to be issued in this manner. The dispatcher should provide against the possibility of matters assuming the shape they did unless he was prepared to annul the meet order if necessary. Since there is no rule to cover the case the situation should not be allowed to occur. If orders are not sent according to the rules they cannot be explained by the rules.

If, however, a train is actually placed in the position described, we do not see how the "meet" order can be disregarded. "Meet" means *meet*, and nothing else. There is no more positive word in the Standard Code and there is not a thing in the rules that relieves a train from meeting an extra when it has orders to do so.

There is, indeed, a principle set forth in the second paragraph of Rule 220 which authorizes the annulment of orders concerning a regular train when it is known that such train has lost its schedule by reason of change of time-table, by being twelve hours late or by the schedule being annulled. But the rule says nothing about an extra, and in its present form cannot be understood to apply to extras. The principle contained in this question, however, has caused so much discussion that the last convention of the Train Dispatchers' Association proposed an addition to Rule 220, applying to extras the principle which is therein set forth as regards regular trains. The matter is receiving considerable attention and when we get a rule saying that a meet order with an extra may be considered annulled when the opposing train has information that the extra has passed out of existence, then, in this case, may extra 1300 proceed after 7 p. m., but in our opinion, rules being as they are, extra 1300 must wait for the work extra.

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322. A Peculiar Order.—"We are on Extra 494 and get an order as follows: 'Engine 494 will run extra A to P, will meet 2d 52 at B and 3d 52 will wait at B until 6 a. m.' Extra 494 cannot make D by 6 a. m. Had 2d 52 a right to go ahead of 3d 52 after 6 a. m., per Rule 94?"—*J. J. M.*

Answer.—The inconsistency of this order makes it difficult to see how any dispatcher could issue it. We can conceive of no reason why such a combination should be put in an order. If such an order were issued, however, 3d 52 would not have a right to take the 2d section ahead of it, for the reason that the 2d section has not "right or schedule which permits it to proceed," as required by the second paragraph of new Rule 94. If the 2d section has a "meet" order at any station all following sections are held by the order just the same as though they were specified in it.

Railway Club Proceedings

*Railway Electrification Questionaire.**

THE DYNAMO.

46—Q. The induction coil assumes the existence of an undulating or an alternating current. How did Faraday apply his discovery to the production of alternating current?

A. Having found that the cutting lines of force could induce current, he proceeded to induce current by moving a wire across a magnetic field. The dynamo is a machine for moving wires across a magnetic field—a machine for cutting lines of force. The essence of the elementary dynamo is a dense magnetic field and a coil of wire that rotates in this field. The greater the rate of cutting, the greater the voltage induced in the rotating coil. This rate can be increased by increasing the number of lines of force in the field, by increasing the number of turns in the coil, and by increasing the rate of rotation of the coil. Ordinarily, however, dynamos are built for moderate voltage and transformers are used to raise the alternating current to the high potential required for long distance transmission.

THE COMMUTATOR.

47—Q. Since induction produces alternating current, whether the inducing apparatus be the transformer or the dynamo, how can the dynamo be made to give continuous current—like that supplied by the storage battery?

A. Alternating current is rectified by the commutator. The commutator is simple enough, but a description of it is rather tedious and need not be given here. It will suffice to recall that in the transformer, while the field is dilating with the increasing primary current, the dilating field cuts across the secondary coil and induces a current in the secondary coil of opposite direction to the current in the primary, and, while the field is contracting with the decreasing primary current, the contracting field cuts across the secondary wires and induces a secondary current of the same direction as the primary. That is to say, the direction of the induced current changes with the change of direction of the motion of the magnetic field. Likewise in the dynamo the direction of the induced current in the armature wire cutting across the field under the north pole, is opposite to the direction of the current induced in the same wire when cutting across the field under the south pole of the dynamo. Consequently it is necessary to group the armature coils and arrange the commutator taps in such a way that if the beginning of the coil leads to the positive brush while the coil is under the north pole, why, the end of the coil will lead to the positive brush when the coil is under the south pole. The direct current dynamo is the alternating current dynamo plus the commutator.

THE DIRECT CURRENT MOTOR.

48—Q. Is the direct current motor structurally a different machine from the direct current dynamo?

A. No. The direct current machine can play the role of dynamo or motor. As a dynamo it transforms motion into electric current.. As a motor it transforms electric current into motion. The steam engine drives the dynamo. The motor drives the locomotive. Both dynamo and motor involve the magnetic properties of the electric current, both machines involve Faraday's discovery of induction.

49—Q. How does the electric motor involve induction?

A. In its simplest form the electric motor consists of a current-carrying wire in a magnetic field. The presence of the current in the wire tends to make the wire move out of the field. The direction of the motion will change with the direction of the current. Consequently, the passage of an alternating current through the wire will cause the wire to vibrate back and forth across the field. This reciprocating motion can be changed into a rotary one, and a motor is the result. So far as motion is concerned, therefore, the motor depends on the magnetic properties of the current. But the very rotation of the armature wires in the magnetic field induces a voltage in the wires. If this induced voltage is less than the line voltage the line voltage drives a current through the motor armature. If the induced voltage equals the line voltage, why, no current flows. If the induced voltage is greater than the line voltage as in the case of the dynamo, why, the armature feeds the current into the line. When the line feeds current into the armature wires, these wires, in their effort to get out of the magnetic field, rotate the motor armature. The stronger the field, the greater the number of wires, and the greater the armature current, why, the greater the torque the motor armature gives.

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*By H. L. Kirker, Resident Engineer, Westinghouse Electric Manufacturing Company, St. Clair Tunnel.—Continued from January, 1909, Magazine.

REGULATION.

50—Q. What regulates the amount of current the motor armature takes?

A. The amount of current the motor armature takes depends upon the difference in pressure between the line voltage and the induced voltage in the motor armature.

51—Q. What regulates this difference in voltage?

A. Primarily the armature speed regulates the voltage induced in the motor armature. If the motor is called upon to exert a torque greater than the actual armature current can exert, why, the armature slows down. The drop in speed lowers the induced voltage. The drop in voltage allows a bigger current to flow. The bigger current exerts a bigger torque. The speed will continue to drop until the current increases to the point that it can exert the required force. On the other hand, a diminution of the motor load means an increase in speed. The increase in the armature speed will increase the induced voltage. The more nearly the motor armature voltage becomes equal to the line voltage, why, the less current the line drives through the motor armature. The armature speed will increase until the current drops to a strength that will give the required torque.

POWER.

52—Q. Admitting that the turning force exerted by the motor armature increases with the current, is it also true that the drag on the steam engine increases with the current delivered by the dynamo armature?

A. Yes. The drag of the dynamo armature on the engine increases with the current. This of course accords with the magnetic properties of the electric current. As pointed out, a current-carrying-wire tends to move of its own accord in a particular direction across a magnetic field. An attempt to move the current-carrying-wire in the opposite direction demands force. An armature, driven at a speed that induces a voltage just equal to the line voltage, neither takes current from the line nor delivers current to the line. A slight drop in speed will drop the induced voltage enough to allow the line to drive a small current back through the armature against the induced voltage. The direction of this current with reference to the magnetic field is such as to make the armature continue to rotate in the same direction. The machine functions as a motor. On the other hand a slight increase in speed will raise the induced voltage higher than the line voltage and with the same direction of rotation will allow the armature to deliver current to the line. The point to note is that the armature current is now flowing in the direction of the induced voltage. The machine is functioning as a dynamo. The direction of rotation remaining the same as that of the motor, and the direction of the current being the reverse of that of the motor, it follows that power must be applied to the armature to keep up the rotation. The greater the current, the greater is the power required, consequently the greater is the drag on the steam engine, and the greater is the steam consumption.

53—Q. Having seen that the transformer and the alternating current dynamo are the commercial application of Faraday's discovery of the induction of current by cutting lines of force, having seen that the addition of the commutator to the alternator enable the machine to deliver continuous current, having seen that the commutating machine can play the part of either direct current dynamo or direct current motor, and having seen that the turning force exerted by the motor and the drag of the dynamo armature on the steam engine are proportional to the current the machines are carrying, do these facts sum up the elementary electric system?

A. Yes. The dynamo, the line, and the motor, link the steam plant to the train. The electric current is the reincarnation of the energy of the steam engine, which energy ultimately appears as train motion. The fact that motion can be transformed into electric energy and that electric energy can be transformed into motion again supplies a commercial means of transmitting enormous power from central stations to distant points of application.

54—Q. What limits the distance electric energy can be transmitted?

A. The commercial limit of course is the investment in equipment. The investment necessary to be able to deliver a given amount of power for a given distance depends on the particular system used.

55—Q. With which system is the commercial limit of the investment first reached?

A. So far as railway work is concerned the limit is first reached with the direct current third rail system.

THIRD RAIL LIMITS.

56—Q. What is the particular limiting feature of the third rail system?

A. The commutator is the feature that limits the direct current system. Six hundred and fifty volts is about the highest pressure the direct current railway motor commutator can handle. (Recent improvements may raise the limit to 1,200 volts.) Now the power of an electric current depends not only on the current strength, but also on the pressure that drives the current. This means of course that electric power is proportional to the product of current by volts. Consequently, if enormous power is transmitted at low voltage, why, enormous currents must be used. For instance an electric zone that involves 30 locomotives of 2,000 horse power each would require, on a 600 volt system, some 84,000 amperes to operate simultaneously the 30 locomotives at their nominal rating. An overhead trolley system could not handle this current. Hence the insulated third rail. Heavy feeder cables would be required to deliver this current to the third rail. Frequent substations would be necessary to cut down the length of these heavy feeder cables. Substations mean moving machinery for changing the alternating current into direct current, and as pointed out, moving machinery means operating crews. The commutator, then, is the occasion of the third rail, with its heavy feeders, and frequent substations with moving machinery. A system loaded with these accessories is necessarily limited to short distance work.

THE SINGLE PHASE MOTOR.

57—Q. Is the single phase railway motor a low voltage motor?

A. Yes. The series single phase railway motor is built for a voltage even lower than that of the direct current railway motor. Its normal pressure is 240 volts—less than half that of the direct current railway motors.

58—Q. Does the fact that the single phase railway motor is a low voltage motor imply insulated third rail?

A. No. On the other hand, the fact that the current is an alternating one admits of a high voltage trolley. The transformer on the car changes high pressure trolley current to low pressure motor current. The application of high pressure alternating current to the trolley of course eliminates the rotary converter substations and leaves the permanent way clear of the charged third rail. On long lines there would be transformer substations, but inasmuch as there are no moving parts about a transformer, no crew is required, and there is a minimum of switch gear in these transformer substations.

59—Q. Why is it necessary to have transformer substations on long distance single phase road?

A. As pointed out, long distance transmission involves high voltage—60,000 volts is in common use on transmission lines. Trolleys can not be insulated for this voltage—11,000 volts about represents the trolley limits at the present stage of the art. Consequently there must be a connecting link between the line and the trolley. The transformer is the link.

60—Q. Is the track used as a part of the circuit in the single phase system?

A. Yes. The track, as in the third rail system, is a part of the circuit. The circuit is made continuous by bonding the joints and connecting the track to the power line. The rails are at the same potential as the ground on which they lie, consequently are as harmless as electric street railway tracks.

INTERFERENCE WITH SIGNAL CIRCUITS.

61—Q. Does the use of the track as a part of the power circuit interfere with the signal system?

A. Yes. Special precautions have to be taken to insulate the signal circuit from the power circuits.

62—Q. Is the alternating current more apt to interfere with the telephone and telegraph circuit than the direct current is apt to interfere with them?

A. Yes. Whenever there is alternating current there is induction. This means that special precautions have to be taken with the telephone and telegraph systems to neutralize the effects of this induction.

63—Q. Electrification then means more or less reconstruction of the signal, telephone and telegraph systems?

A. Yes. More reconstruction is necessary when the alternating current is used than when the direct is used. However, there should be no electrolysis of pipes and structures when alternating current is used.

64—Q. Admitting that the single phase system eliminates the rotary converter substations, eliminates the third rail, eliminates the electrolysis; admitting that it extends the overhead trolley to main line railway work, and admitting that its effects on the signal systems can be neutralized, is it also true that the single phase railway motor is as simple a machine as the direct current railway motor?

A. No. The single phase series railway motor is a special case of the direct current railway motor. Since the single phase motor operates on alternating current, special design is necessary to minimize the results of induction incident to alternating current. Refinement in design has reduced the heating and sparking effects of this induction to such a point that the single phase railway motor is now a commercial machine.

POWER FACTOR.

65—Q. Has not the alternating current another distinctive characteristic?

A. Yes. In the direct current system the power is the product of the current by the volts. In the alternating current system the power is generally less than the product of the current by the volts. The power factor of the alternating current motor may be as low as 75 per cent. of the product of the current by the volts. This is due to the fact that the pressure is an alternating one, and that the waves of current resulting from this pressure are not maximum when the pressure is maximum. The lag of the current wave behind the pressure wave varies with the amount of self-induction the alternating current produces in the circuit. The less the lag of the current crest behind the voltage crest, the more nearly the power factor of the circuit becomes unity. The single phase motor must be designed to give a large power factor—otherwise it will be much larger for a given output than a direct current motor of equal capacity.

66—Q. Is the speed of the series single phase motor dependent on the frequency of the alternating current?

A. No. As in the case of the direct current series motor the speed depends on the load on the motor. As previously pointed out, an increase of load on the motor pulls down the speed to a point that allows a current to flow that will give the required torque. In the case of the series motor, as the name implies, the armature winding is in series with the field winding, consequently, since the current that flows through the armature also flows through the field an increase in current strengthens the field. Consequently there is an increase in torque not only on account of increase in armature current, but also on account of increase in field strength. This increased field strength also means that the armature can induce approximately the same voltage at a lower speed. These two facts—the increase in torque due to increased armature current with its consequent increased field strength, and the drop in speed incident to increased field strength—explain the powerful accelerating force exerted by the locomotive equipped with series motors; they also explain the small amount of power required to produce this acceleration. Now the fact that the armature current and the field magnetism reverse simultaneously means that the direction of rotation remains unchanged, consequently, the frequency with which these reversals take place does not determine the armature speed.

67—Q. What is the frequency in use on existing single phase roads on America?

A. The frequency in use on the single phase railway systems in America is the same as that in most of the greater power stations in America—25 cycle—that is to say, the waves of current follow each other through the circuit at the rate of twenty-five waves per second.

68—Q. Is twenty-five cycle the most satisfactory frequency for the single phase locomotive?

A. The designers of the electric locomotive maintain that a lower frequency would mean that a more powerful machine could be placed in the limiting dimensions of the locomotive. They maintain that the application of the single phase motor to railway work will be so extensive that the aggregate advantage of a lower frequency motor will offset the disadvantage of a frequency different from that now used in most American power stations.

THREE PHASE GENERATOR AND MOTOR.

69—Q. Having seen that the simple alternator is the result of Faraday's discovery of induction, and that the addition of the commutator to the alternator enables it to deliver current in a continuous stream, and having seen that the commutating machine becomes a motor when supplied with continuous current, and having seen that a series motor of special design can operate on the waves of current supplied by the simple alternator, and having seen that the application of alternating current to railway work eliminates the rotary converter substations and substitutes the high voltage trolley for the low voltage third rail, is it true that the alternator that supplies current for the single phase motor is fundamentally the same machine that supplies current for the three phase motor.

A. Yes. The single phase armature can be tapped to give three phase current, but ordinarily the winding of the three phase armature consists of three coils (one for each line wire). It is a three-legged arrangement. One terminal of each coil goes to its respective line wire, the other terminal of each coil goes to a common junction. The windings are so disposed that each coil successively sends a wave of current out its line wire, through the motor and back through the other two line wires through the other two armature coils to the common junction.

70—Q. Is the three phase motor in common use?

A. Yes. Its simplicity of construction has led to its application in enormous numbers to constant speed work. It has no commutator. The winding of the rotating part consists essentially of a squirrel cage of copper embedded in an iron rotor core. The rotating field set up by the three phase current induces a current in the squirrel cage. The magnetic properties of the induced current cause the squirrel cage to be dragged around by the rotating magnetic field.

THE ROTATING MAGNETIC FIELD.

71—Q. How does the three phase current create a rotating magnetic field?

A. The rotating magnetic field is produced somewhat in the same fashion that a three crank arrangement produces rotation. The winding of the stationary part of the motor is essentially that of the three phase generator armature. There are three coils—one for each line wire. One terminal of each coil goes to a line wire, the other terminals go to a common junction. These coils are disposed around the stator so as to lie relatively 120 degrees from one another. A wave of current through one of the coils sets up the magnetic field across a particular diameter of stator. An instant later a wave of current through the second coil sets up the magnetic field across a diameter 120 degrees in advance of where it was before. An instant later a wave of current through the third coil sets up the magnetic field across the third diameter 120 degrees in advance of where it was the instant before. An instant later another wave of current through the first coil advances the field another 120 degrees, completing the revolution. In other words, the generator dispatches a wave of current into one line wire and then an instant later a wave of current into the second line wire, then an instant later a wave into the third line wire, then an instant later another wave into the first line wire and so on. Timing these waves in terms of one revolution of the generator armature, the crest of the wave in the first line is 120 degrees ahead of the crest of the wave of the second line wire, the crest of the wave in the second line is 120 degrees ahead of the crest of the wave in the third line wire, the crest of the wave of the third line wire is 120 degrees ahead of the crest of the second wave in the first line wire, and so on. This successive 120 degrees difference in phase of the three line currents consequently produces a rotating field in the motor.

72—Q. Does the speed of the three phase motor depend upon the frequency of the current waves?

A. Yes. Since a group of one wave per circuit means (in a simple machine) one revolution of the magnetic field, it follows that the number of revolutions the rotating field makes per second equals the number of waves (per circuit) per second. If, for instance, twenty-five waves travel along each line wire per second, the magnetic field will make twenty-five revolutions per second. It also follows that since the speed of the generator is fixed, why, the number of current waves per second is fixed, the number of revolutions the rotating field makes per second is fixed, consequently the speed of the motor is fixed.

73—Q. Is the fact that the speed of the three phase motor is fixed a disadvantage in the electric locomotive?

A. It happens that the disadvantage is not so great as it would seem since at least three speeds can be obtained by grouping the motors and regrouping the field windings of the motor.

RECUPERATION.

74—Q. Is there any advantage that is more or less peculiar to the three phase motor?

A. Yes. The three phase motor readily lends itself to the electric braking. This feature was perhaps the deciding one in the adoption of the three phase locomotive for the Cascade Tunnel. On down grade the motors on the locomotive can act as generators and feed current into the line. The fact that they are acting as generators means that they are consuming power that would otherwise have to be used up in brake shoes. This power fed into the line helps out of course the power station in dragging other locomotives up grade. The single phase locomotive also can feed current into the line on down grade, likewise the direct current locomotive, but hardly with the same simplicity as the three phase locomotive. It must be added, however, that the single phase motor has this advantage over the three phase motor, namely, it can feed current back into the line over a wide range of speed, while the three phase can feed back at but one speed.

75—Q. Is the three phase railway motor a high voltage motor?

A. Yes. It can be built for pressure as high as 6,000 volts. This means that with a 6,000 volt trolley pressure no reducing transformer is required on the locomotive.

76—Q. Is the track a part of the circuit when three phase locomotives are used?

A. Yes, the bonded track constitutes one line wire. The two overhead trolleys are the other two line wires.

77—Q. Does the fact that the three phase locomotive requires two overhead trolleys place a serious handicap on the system?

A. The presence of two overhead trolleys, insulated from each other and from the rail necessarily means a more or less complicated trolley system, especially at turnouts and in terminals. It also means a double collecting device. This double overhead system and double collecting device of course cannot compare in simplicity with the single phase trolley.

SUMMARY.

78—Q. Have the three phase system, the single phase system and the third rail system any pronounced characteristics than those already mentioned?

A. No. The characteristics of the three systems are few and distinct. The three phase system implies two overhead trolleys, and practically the same speed up grade as on level track. It, like the single phase system, can be easily extended to long distance work by the use of simple transformer substations. The single phase system, in addition to this long distance advantage which it shares with the three phase system, has the distinct advantage resulting from a single overhead trolley. The single phase system possesses in common with the direct current system the speed characteristics of the steam locomotive. The third rail system has the advantage of twenty-five years of experience, and a splendid record. The handicap of the third rail system are the charged third rail, the heavy feeders and the substations necessary for changing the alternating current into the direct.

79—Q. Are there no other electric railway systems than the direct current, the single phase and the three phase?

A. Yes, there are others, but these are the only ones doing heavy railway work.

80—Q. Admitting that the electric locomotive (whether direct current or single phase or three phase) is a powerful engine, and that it can easily exceed the steam locomotive in draw bar pull and speed, admitting that the motors can readily stand the hard usage that railway work involves, is it true that the auxiliary apparatus required for collecting the current and controlling the application of the current to the motors is sufficiently simple and reliable to meet the requirements of railway service?

A. The current collecting and controlling devices can be made as simple and as reliable as the air brake mechanism. Moreover, as with the air brake, the wearing parts are easily replaced, and similar groups are interchangeable. Once a grasp of the simple underlying principle of the electric system is obtained, a working knowledge of the apparatus is easily acquired. The current collecting device, the automatic cut-out, the master controller, rheostat (or auto transformer, as the case may be), and the switch group all have their particular duties to perform. A failure of any of these parts cripples the locomotive. Consequently these auxiliaries, in addition to their reliability and durability, are built for quick repairs and easy replacement.

81—Q. Is "double heading" easier with electric locomotives than with steam locomotives?

A. Yes. Electric locomotives can be grouped to act as a single unit. The combined group can be handled by the master controller and brake valve of any one of the constituent units. Moreover, if all the cars were equipped with a train-control line, the locomotives could be distributed through the train and handled as a single locomotive from any one of the units. The equipping of freight cars with a train-control line is not necessarily a more serious undertaking than equipping freight cars with air brakes. It is merely a means of interconnecting the master controllers of the various locomotives and putting them under the control of one operator. However, it implies of course a common scheme of control in order that the freight cars be interchangeable on the different roads.

82—Q. Is the electric locomotive the only means of applying the motor to railway work?

A. No. Instead of concentrating powerful motors in one engine, smaller motors can be placed on several cars of the train, the train can be equipped with a control line, and consequently all the motors can be controlled from any one of the master controllers. This is the system of multiple-unit-train-control used on the New York subway, the Mersey Railway, the London Metropolitan and Paris Metropolitan and many other roads. It is equally applicable to suburban passenger service and even to main line passenger service.

83—Q. Does electrification necessarily involve a revolution in transportation methods when applied to existing steam roads?

A. Eventually, yes. In most cases where electrification has been applied it has been merely a substitution of the electric locomotive or multiple unit control for the steam locomotive. The more general application of electrification, however, is sure to modify present methods of transportation. Mr. Steinmetz sums up electrification to mean "that the change from steam power to electric power is not a mere substitution of the electric locomotive for the steam locomotive, but a readjustment of the ways of operation; that is, an increase of speed of operation of freight service by taking advantage of the feature of the electric locomotive being able to carry its draw bar pull up to a higher speed. Higher speed necessarily means increased capacity of the system, even with less draw bar pull, and in this feature lies the main advantages of electric traction, but it is necessary to readjust the method of operation to the changed conditions of railroad motive power to get the best results with the electric locomotive."

References:

J. E. Muhlfeld—"Large Electric and Steam Locomotive"—New York Railroad Club—February 16, 1906.

B. G. Lamme—"Alternating Current Electric Systems for Heavy Railway Service"—New York Railway Club—March 16, 1906.

W. S. Murray—"Train Resistance and the Fuel Relations Between Heavy Steam and Electric Traction"—Electrical Age—October, 1906.

Stillwell and Putnam—"Substitution of Electric Motor for Steam Locomotive"—Trans. Am. Inst. Elec. Eng.—January, 1907.

F. J. Sprague—"Some Facts and Problems Bearing on Electric Trunk Line Operation"—Trans. Am. Inst. Elec. Eng.—July, 1907.

N. W. Storer—"Twenty-five vs. Fifteen Cycle for Heavy Railway Work"—Trans. Am. Inst. Elec. Eng.—July, 1907.

Max Toltz—"Steam vs. Electric Locomotives"—New York Railroad Club—September 20, 1907.

Philip Dawson—"Electric Equipment of Main Line Railways in Europe"—Street Railway Journal—October 12, 1907.

A. H. Armstrong—"Comparative Performance of Steam and Electric Locomotives"—Trans. Am. Inst. Elec. Eng.—October, 1907.

W. N. Smith—"Practical Aspects of Steam Road Electrification"—Trans. Am. Inst. Elec. Eng.—January, 1908.

A. D. Williams—"The Third Rail

Problem"—The Engineering Magazine—January, 1908.

W. S. Murray—"The New Haven System of Single Phase Distribution with Special Reference to Sectionalization"—Trans. Am. Inst. Elec. Eng.—January, 1908.

American Railway Master Mechanics' Association proceedings, 1905.

THE CHAIRMAN: Well, gentlemen, I am sure you have all listened with interest to the excellent paper read to us this evening by Mr. Kirker. I am very sorry that such a paper, together with the discussion that took place in the early part of the evening, should have brought us to such a late hour, but whether Mr. Kirker has made champions of the electrical locomotive in the Railway Club or not, I am sure some of the gentlemen present should have something to say on the subject or to ask some questions of Mr. Kirker. I think it is only right that the writer of such an important paper should have an opportunity to listen to some criticisms or to answer questions that may be asked.

MR. DIETRICH: Mr. Chairman, with a view of opening the discussion, I would like to make a few remarks. We are certainly under a great obligation to Mr. Kirker for having prepared this very valuable paper.

I have noted in the paper the terms "commutator," "primary current," "secondary current," "decreasing primary current," "armature wire," "motion of the field," "north pole," "south pole" and several other electrical terms. These expressions are all included in one paragraph, and while they may have been "Greek" to some of the members present before the paper was read, the matter has been put in such shape that those who have made a study of the paper before they came here or have followed closely the reading of the paper should comprehend at least to some extent their meaning. There is ample opportunity of getting information from this paper, and I would advise those who wish to become informed on the subject to study it closely.

I have in mind a section of railway about 160 or 170 miles long, on which I had occasion to do some figuring some time ago, with a view of determining whether it was advisable to electrify that section. One way I had of looking at it was to assume that the railway was already equipped with everything except motive power, the problem being whether it would be most advantageous to operate it with steam motive power or electric motive power. As near as I can recollect the road at that time was being operated by about twenty small steam locomotives, each capable of developing about one thousand horse-power at the draw bar.

The more I study the steam locomotive the more wonderful it becomes to me. It is, of course, a complete, self-contained power plant, similar in many respects to a stationary power plant. When, however, one considers that in its design the builders are tied down to small clearances, and that it has to be able to transport itself up and down the road at high rates of speed and carry its own supply of fuel and water, and notwithstanding the difficulties of meeting these conditions, that the locomotive can be built at a cost of approximately $10 per horse-power, whereas a stationary power plant frequently costs ten times as much, or $100 per horse-power, even where land is cheap and fuel and water supply convenient. Considered in this light I think you will agree that the steam locomotive is truly a wonderful invention. In addition to being cheap, the steam motive power is flexible and can be varied to suit the conditions, that is to say: If the road is being operated by a certain number of engines and the business should suddenly increase at any season of the year, other engines can be borrowed from another division of the road, and if the business should decrease, engines can be liberated and sent to other divisions where required. On the other hand, where it is desired to operate a road electrically, a power house has to be built large enough to take care of the maximum requirements.

Now we will go back to our problem.

On the steam side we have twenty steam locomotives each of 1,000 horse-power capacity and costing, at $10 per horse-power, ten thousand ($10,000) dollars apiece, or a total cost of two hundred thousand ($200,000) dollars.

On the electric side, to provide for all requirements, we need first an electric power plant of about twenty thousand horse-power, which, if made thoroughly up to date, would cost, at $100 per horse-power, two million ($2,000,000) dollars. The electrification would include step-up transformers, transmission lines, trolley line (which should be of catenary construction), feeders, bonding of rails and either rotary substations or transformer substations, with frequency changing stations, and would cost, for alternating current apparatus, about eight hundred thousand ($800,000) dollars, and for direct current equipment over a million ($1,000,000) dollars.

Having made provision for the power plant and the electrification of the roadbed, we still require the electric locomotives and motor cars to replace the steam locomotives.

Now for equal draw bar pull. The electric and steam locomotives will have to be of about equal weight. But note that, whereas the steam locomotive is built of iron and steel, at a cost of about eight or nine cents per pound, a large portion of the electric locomotive consists of copper and brass, worth about fifteen cents in the raw state. You will easily see, therefore, that an electric locomotive will cost much more than a steam locomotive of equal capacity. We might assume that this extra cost would be largely offset by a reduction that might be made in the number of electric locomotives required, owing to their ability to remain a longer time in active service. Our estimate for electric locomotives would therefore be two hundred thousand ($200,000) dollars. Now let us add up these different items. First—Power plant, $2,000,000; second—electrification of roadbed, $800,000; third—electric locomotives, $200,000. The total is therefore three million ($3,000,000) dollars for electrification, whereas two hundred thousand ($200,000) dollars is sufficient to provide the motive power to operate the section with steam.

In view of these remarks you will readily understand that our railroad officials will be quite justified in going very slowly into the matter of electrification of our railways.

MR. VAUGHAN: It is getting late, but I would like to have an opportunity of thanking Mr. Kirker for the very interesting paper. It is such a wide paper that it is very hard to discuss it in any coherent manner, but I think Mr. Kirker has put the case very fairly. As I understand his reasoning, it is that the electric locomotive is forced on us by conditions more than by general application to trunk line work. In the case Mr. Dietrich referred to of the piece of road we thought of electrifying, we could no doubt haul heavier trains, but if we spent the additional amount necessary to install electricity in increasing the capacity of the bridges and reducing grades we could use heavier steam locomotives and haul heavier trains than with electric locomotives on the original line. I think Mr. Kirker means that the electric locomotive has the advantage only in exceptional circumstances, but before we come to electrifying trunk lines the steam railways have got to reach their limit, and before they reach their limit we have got to go from single to double track and to quadruple tracks. I think that up to that point steam operation will be found to be cheaper, except in extraordinary circumstances.

I would like to say one or two things against the steam locomotive. It seems to be the fashion for us to blame our own trades at present. Mr. Kirker has mentioned the coal consumption of a steam locomotive as being four pounds of coal per horse-power hour. It seems to me that is rather low. I went into that question in rather an interesting manner. We get all our coal figures out on a basis of so many pounds of coal consumed per thousand tons hauled one mile. Now, a horse-power is 33,000 foot-pounds per minute, and that rate of work kept up for sixty minutes is a horse-power hour, or 1,980,000, nearly 2,000,000 foot-pounds. With resistance of ten pounds per ton per foot, a ton hauled one mile is 5,280 feet multiplied by ten pounds, or 52,800 foot-pounds, and a thousand-ton mile is 52,800,000 foot-pounds; so that a thousand tons one mile would equal 26.7 horse-power hours. We found, however, that on our Smith's Falls section, for instance, the resistance is only slightly over five pounds, so that a thousand ton mile would equal only about fourteen horse-power hours. Now, the best coal records we have on that district are about ninety pounds per thousand ton mile, so that would equal between 6¾ to 7 pounds of coal per horse-power on that section, and on going over the various other sections of the line that figure works out pretty uniformly.

The fact is, however, that there is a large amount of coal in railway service that is not accounted for, which would give you the three or four pounds per horse-power hour arrived at in tests. To begin with, the figure mentioned by Mr. Kirker, I am inclined to think, is the consumption per horse-power hour at the tread of the wheel, without taking into account the engine friction. Then there is coal used in lighting up, and, of course, there is a large quantity of coal used on side tracks and in operating the air pump. When all these are taken into consideration, the net result would be about seven pounds per horse-power instead of four. It may be said that I am assuming our locomotives are equally economical with those tested. Ninety pounds of coal per thousand ton mile is an exceptional figure, and is one of the most economical figures that I have ever heard of, and I think it is fair to say that seven pounds of coal per horse-power hour is a low figure for locomotives. The locomotives referred to are compound engines.

Coming down to the maintenance question, I do not think anybody knows the cost of maintenance of electric locomotives. If we were considering the cost of maintaining a new steam engine we would get a gloriously low cost, but it takes from five to eight years for a locomotive to arrive at the average cost of maintenance. The first two years it is much cheaper, but after ten years it costs considerably more; the heavy rebuilding question comes in and the cost goes up. I feel very strongly that the electric locomotive is going to be about the same thing, because the repairs the first few years are small and affect only the unimportant parts of the mechanism, but when the electric locomotive has been used for six or eight years, and we get the cost of repairs, then we would have something to figure on. One argument in support of this is that the steam locomotive costs per annum about ten per cent. of the original cost to repair; a passenger car from seven to ten per cent., and a freight car about seven per cent. There is a great deal of work which is common to both types of locomotive which would indicate that it should not vary much from such an average charge, and they are now introducing certain steam locomotive features into the electric locomotive, such as side rods, etc., which seems to be the tendency today.

The electric locomotives have been running for six months on the New Haven road, and somewhat longer on the New York Central, and we have heard rumors of more or less trouble. Of course in such cases as that new installation and untried methods have something to do with it, but I would like to know if any saving has been made. I remember seeing a short time ago on the New Haven road near New York a train of six cars being pulled by two electric locomotives. Now, the New Haven locomotive is put down as being 1,000 horse-power, but one of our "Pacific type" locomotives, which have not given much more than 1,000 horse-power at the draw bar, could easily pull much more than that. When you go down to the New Haven road and see two electric locomotives pulling a train that one of our "Pacific type" could pull, you at once ask the question: Is that electric locomotive developing 1,000 horse-power? The New York Central seems to be doing a great deal better. Their locomotive seems to be handling the business in a way equal to or almost as good as the steam locomotive, but when the New Haven put two locomotives on a passenger train of eight cars weighing not more than thirty tons each, or a total of 240 tons, that one of our steam locomotives would handle, the thing is getting expensive, and when the respective costs of those locomotives is considered, the steam engine, costing about $20,000 and the electric locomotive about $60,000, the proportion is out of all reason.

I do not want to take a position against electrification. I firmly believe it is coming in certain circumstances, and I have advocated it strongly in two cases on the Canadian Pacific, but I think in railway work there is going to be an enormous amount of money spent on other improvements before it is going to be advisable to spend it on electrification.

MR. SHAW: Mr. President, I would like to say something in connection with the figures quoted by Mr. Dietrich.

The entire amount of money mentioned by Mr. Dietrich would not have required to have been spent. For instance, by far the largest outlay was for a power plant to operate the 175 miles of line. Now, in this very instance, as well as in a great many others in this country of ours, we do not need to put in that power house, and the greater part of the expense in that connection could be saved by making use of the white coal of Canada.

Again, in the case of steam operation there is a large outlay for coaling plants, water tanks and repair shops which would all be eliminated on an electric road.

MR. T. A. CHUBB: Mr. President, there are one or two points in this paper

I would like to refer to, in regard to which facts that came under my observation may be of interest to members of the club.

In the first place, Mr. Kirker mentions some enormous Mallet compound locomotives which have been built in the United States, presumably as an alternative to electric traction.

These machines were built for freight service, but a very similar case arose in connection with the suburban passenger service of the Great Eastern Railway, England, when the question arose as to ways and means of increasing the average train speed over a road with frequent stops and an extremely congested traffic.

With this end in view the locomotive superintendent designed and built a Decapod tank engine of great weight, which could start from a dead stand and attain a speed of thirty miles per hour in thirty seconds with the standard train of fourteen six-wheeled coaches.

The locomotive was a success, but the acceleration was too great for the tracks, and the experiment was abandoned.

In that instance the relaying of all the tracks will be an extremely expensive matter if it is ever done, as it must be if the service speed is to increase under steam conditions, but electric traction with multiple unit trains would solve the problem, for one of the principal beauties of the electric system is its capacity for this great acceleration and for starting and stopping frequently, easily and smoothly.

Another point Mr. Kirker has referred to—the distance of signal circuits.

There was a case which caused serious trouble on the Metropolitan District Railway in London. This road crosses at one point the Central London Railway, a deep-level electric line, and at the point of intersection is located one of the rotary-converter substations of the Central London Railway.

That substation burnt out on the occasion referred to, and the result of the disturbance in the high-tension, three-phase distribution system of the Central Line Railway was to paralyze completely the signal circuits of the Metropolitan District Railway in their tunnel above by inductive effects; and in my humble opinion Mr. Kirker's paragraph on this point touches too lightly on the possibilities of disturbance in, not signal circuits alone, but any circuit located near an alternating system which is liable to interruption.

Regarding the question of motor ratings, Mr. Vaughan stated that two electric locomotives are seen on the New Haven road doing work which a single steam locomotive would be reasonably expected to do.

That condition is seen on the Metropolitan District Railway in London, where the trains of the Northwestern and Great Western Railways are hauled in to the end of the open road by their own small steam locomotives, which are then detached and their place taken by two Metropolitan District Railway electric locomotives for the tunnel trip into the city terminal.

This is just a corroboration of Mr. Vaughan's observation as regards the New Haven, for these Metropolitan District Railway electric locomotives are, each of them, four-motor machines, with motors rated at 200 horse-power each, giving a total of 1,600 rated horse-power at the head of a train of ten six-wheel coaches, which are handled normally by a six-wheel steam locomotive which certainly does not develop anything like that power at the draw bar.

THE CHAIRMAN: Perhaps Mr. Kirker would like to say a few words in reply to the criticisms which have been made.

MR. H. L. KIRKER: Mr. Chairman and gentlemen, I have noted with interest the criticisms made by the gentlemen who have taken part in the discussion, and I am especially interested in those directed at electric locomotive maintenance and the ability of the single phase locomotive to do its work. However, I came here to proselyte no one to railway electrification in general nor to any one kind of electric locomotive in particular. My paper was intended to be descriptive. I aimed to present the subject of railway electrification in a way that would appeal to busy railway men interested in the subject. There are too many points involved to be able to discuss all of them in detail in one evening.

The subject of maintenance is one on which there is a wide diversity of opinion. Fortunately, Mr. Wilgus has been able to give us some authoritative information on the relative maintenance of the New York Central steam and electric locomotives. The results are decidedly in favor of the electric locomotive. I am not sufficiently familiar with the electric operation on the New York, New Haven & Hartford Railway to furnish any definite information as to the results that are being obtained there. The undertaking is a big one, and the system represents the latest development in electric railway work. I dare say the system is experiencing some growing pains. I have no doubt as to the ability of the single phase locomotive to do its work. The New York, New Haven & Hartford Railway Company has within the last few weeks ordered six more of these locomotives. I can give you some authoritative information as to the St. Clair tunnel single phase locomotives. The transition from steam to electric service is now taking place. The transition is being made gradually. We alternate the steam service with the electric. The single phase locomotives are hauling bigger trains than the steam locomotives haul, and are hauling them faster than steam locomotives can haul their trains. The steam locomotives can scarcely make the grade with a 700-ton train. The single phase locomotive climbs the mile of two per cent. grade with a 1,000-ton train at a speed of ten miles per hour. It has started a 1,000-ton train on the grade and carried it on over the summit. The operation to date has been entirely satisfactory. We intend to extend this alternate steam and electric service over a period of several weeks, for the inauguration of an electric service is more a question of men than of machinery. The experience the men are acquiring must have time to soak in. The situation cannot be forced. This alternate service gives the men the necessary time for adapting themselves to the new operating conditions. The manner in which they are taking hold is gratifying to all concerned. I will indulge, however, in no pleasing speculations. I am quite content to abide by the results of this particular installation and let railway electrification be judged by its works.

THE CHAIRMAN: Gentlemen, I am quite sure we are all very much indebted to Mr. Kirker for his paper and for the information he has given us on the subject of electrification of railways. There is no doubt it is a question which demands a great deal of attention, and there will come a time when the electric motor will in many cases take the place of the steam locomotive.

A vote of thanks to Mr. Kirker for his paper was duly moved and carried unanimously.—March 3, 1908, meeting Canadian Railway Club.

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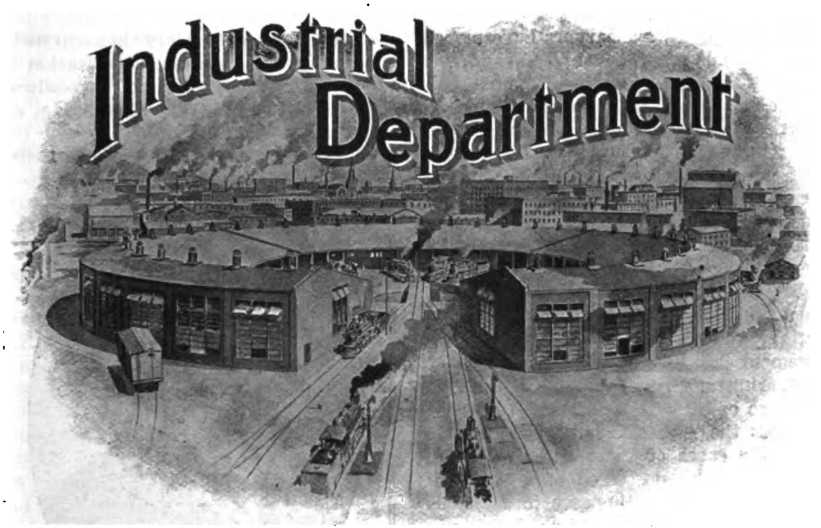

DISCUSSION OF CURRENT TOPICS

Latest Judicial Outrage.—Gompers, Mitchell and Morrison Sentenced to Jail.

The Constitution of the United States undertakes to guarantee that no man shall be deprived of his life, liberty or property unless by due process of law. Under the exercise of judicial power, however, since the federal judiciary has come so largely under the control, direct or indirect, of our modern plutocracy, no honest and law-abiding citizen is secure in the possession of his liberty or property if in the exercise of his constitutional rights he happens to obstruct the wealth-absorbing plans of the law-breaking money power.

The extent to which laws have been interpreted in the interests of the wealthy by federal judges and decisions rendered in accordance with such interpretations has of late years been so flagrantly unjust and out of reason as to seriously shake the confidence of the masses in federal courts.

Federal judges, being appointed for life, and consequently free from the restraining apprehension of popular disapproval which regulates the conduct of the incumbents of elective offices, and being also for the most part judicialized corporation attorneys, seem to imagine that the promotion of plutocratic interests should be supreme and paramount to all other considerations, and do not hesitate to outrage every sense of right and justice and trample on the constitution in endeavoring to make them so. The common people no longer have any rights the exercise of which may be in conflict with the interests of the plutocracy.

The most flagrant judicial outrage against the constitutional rights of American citizenship that is thus far on record was perpetrated when a federal judge, by name Wright—judge of the Supreme Court of the District of Columbia—and who holds his position through the influence of a discredited United States senator—sentenced to jail under the pretext of guilt of contempt of court three men who have never violated a law of the land, whose characters, both private and official, are unassailable, and whose standing and integrity have ever been unquestioned, viz., Samuel Gompers, John Mitchell and Frank Morrison, respectively president, second vice-president and secretary of the American Federation of Labor. Their only offense was that they dared to exercise their constitutional rights in the defense of the interests of the workingman—interests which millions of the country's wage-earners have placed in their hands to protect and advance.

Far from degrading these men by incarcerating them in felons' cells, their presence there will rather glorify such surroundings.

Of Samuel Gompers and John Mitchell it can be truly said that no more genuinely honest, sincere, wise, capable or more self-sacrificing advocates of the cause of the oppressed masses have ever lived. On the integrity of Frank Morrison no man has ever dared to cast a reflection, and as an official in the labor movement he has ever been assiduous, persevering and conscientious in the performance of all of his duties.

Unless the higher judicial tribunals to which the cases of these three men will be appealed are possessed of a sufficient sense of justice and honesty to set aside Judge Wright's decision, they will be compelled to don the felon's garb and serve these sentences as though they were common criminals, but in their case the jail environment will lose its stigma, for.

"Far dearer the grave or the prison,
  Illumed by one patriot name,
Than the trophies of all who have risen
  On liberty's ruin to fame."

It is to be hoped and it is expected that common justice will prevail and that the outrageous decision from which these sentences have resulted will be set aside by a higher court, but if it is not, and if Gompers, Mitchell and Morrison are forced to serve them it will so arouse the wage-earners of the country and the common people generally to a realization of the dangers which threaten them that it will mark the beginning of an epoch than which none in the history of the country has been more important and revolutionizing.

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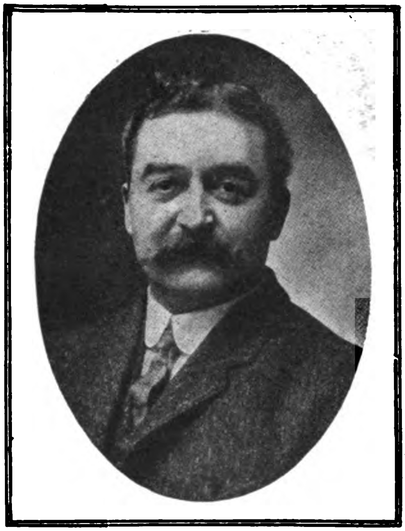
Another Labor Congressman.

Another member of organized labor who, besides those mentioned in our last issue, was chosen for Congress at the November, 1908, election, is William Joseph Cary.

Brother Cary was born in Milwaukee, Wis., March 22, 1865, and was forced by stern necessity at the early age of thirteen to enter the army of wage-earners in order to gain a livelihood for himself and his five young orphan sisters and brothers.

He began his labor career as a messenger boy, and at 18 he was a telegraph operator. Brother Cary has carried a card of the telegraphers' organization for a quarter of a century and has always espoused the cause of labor. He was elected alderman in 1900 and re-elected in 1902. He was elected sheriff of Milwaukee County in 1904, and to Congress in 1906, being re-elected to Congress in 1908.



CONGRESSMAN WILLIAM J. CARY

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Answer to Question Bearing on Operation of Sixteen-Hour Law.

Please give me a ruling on the following:

"I was called for duty at 12:15 a. m. Relieved at 6:35 a. m., same date; called again at 2:00 p. m. Relieved at 6:00 p. m., same date as above, and called again at 1:00 a. m. on the following date, and refused to go, as I had not had eight consecutive hours off duty in the 24-hour period. The foreman says we had a right to go out and make this four-hour run, as we could do it in the 16-hour period. I admit being on duty only ten hours and twenty minutes in the aggregate, but did not have eight consecutive hours off duty in the 24-hour period.

"Kindly advise through the Magazine who was right, and oblige,

"Yours fraternally,
"JAMES PONTING, No. 86,
Laramie, Wyo."

According to the foregoing, Brother Ponting was called for duty at 12:15 a. m., relieved at 6:35 a. m., same date; called again at 2:00 p. m., relieved at 6:00 p. m., same date as above, and called again at 1:00 a. m. on the following date, and that he refused to go out because he had not had eight consecutive hours off duty in the 24-hour period.

Section No. 2 of the act states that an employe who has been on duty sixteen hours in the aggregate in any 24-hour period shall have at least eight hours off duty before being again called for service. According to the statement of Brother Ponting he was on duty only ten hours and twenty minutes in the 24-hour period. His 24-hour period began at 12:15 a. m. and necessarily ended at 12:15 the following morning. He only worked ten hours and twenty minutes during that period; therefore, the company had a right to call him for duty at 1:00 a. m. following the end of his 24-hour period. After being relieved at 6:00 p. m. he was not entitled to the full eight-hour rest under the law. The requirement that a man shall have at least eight consecutive hours off duty does not become effective until after he has been on duty 16 hours in the aggregate within the 24-hour period, so that the position taken by Brother Ponting is wrong.—[EDITOR.]

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The A. F. of L. Convention.

In addition to the important enactments of the recent convention of the American Federation of Labor, referred to in our last issue, that body took action on the following important questions:

Civil Service.

A resolution was adopted endorsing the national civil service law and urging the enforcement of it in its true spirit. The delegates also declared themselves emphatically in favor of a retirement bill as a matter of justice to the employes and to procure better service for the government, as such a law would serve as a worthy object lesson for states, counties and cities, and also for large employers of labor.

Immigration.

A resolution to petition Congress to pass a law requiring educational qualifications as a means of restricting immigration was unanimously adopted by the convention.

Organization of Agricultural Workers.

There being about 3,000,000 agricultural workers in the country who seek work wherever it can be found, and whose meager wages prevent them from assuming family responsibilities and establishing permanent homes, and as these men are in need of the power of organization and it is to the wage-earner's mutual interest that they should be acquainted with the aims and purposes of organized labor, the committee on organization was instructed to formulate the best possible plan to organize them.

Laborers in Federal Employ.

Whereas, when the federal and state governments, as well as private corporations, undertake construction work in sparsely populated districts the workmen are generally huddled together in freight cars and sheds under conditions which are destructive of both health and morals, and under these conditions they are compelled to live for months at a time, and are unable to attend to the most ordinary requirements of cleanliness, thereby impairing their own health and helping to spread filth and disease among all with whom they come in contact after the work has been completed, and as such conditions are repugnant to the spirit of our time, the convention expressed its abhorrence of such conditions and condemned the treatment accorded to the men employed on such work. It also instructed the Executive Committee of the A. F. of L. to demand from the federal congress and the executive heads of governmental departments to provide such laws and regulations as will afford the men engaged in the work mentioned such quarters and sleeping accommodations as is conducive to sanitary and healthful lives.

Woman's Suffrage.

The economic platform of the A. F. of L. adopted by the Minneapolis convention and reaffirmed and amended by the Norfolk convention, containing planks in favor of complete enfranchisement of all men and women, and pledging the united support of the affiliated unions to work for their political freedom, was reaffirmed by this convention.

Free Text-Books.

Realizing the importance of education as a great factor in the labor movement, and as it is to the interest of organized labor that every child should receive the highest possible standard of education in order that they may be better equipped for the battle of life, the American Federation of Labor declared itself in favor of free text-books in order to help the thousands of poor children who are deprived of the rights of an education due to the poverty of their parents and requests all affiliated unions to assist in furthering this cause.

Union Labels.

Whereas the courts of the country have denied the trade unionists their constitutional rights on several occasions, and have enjoined them from doing things which are perfectly in accordance with the moral and civil laws and to the welfare of organized labor in general, but to the present time they have not been enjoined from putting union labels on the goods of employers who want them, nor have they been enjoined from requesting their friends to patronize union-made products or reminding them of goods bearing the union label, it was resolved that the gospel of the union label should be their watchword, and that they should faithfully work to make its universal use one of their paramount demands as a means of uplifting the wage-earners of the country.

Organized Women Workers.

It being the opinion that the women wage-earners of the country who are employed in hotels, restaurants, cafés and other public service establishments work under conditions that should not prevail in a free country, and that if the trade unionists in general would give their moral support and co-operation in organizing the women wage-earners employed in these establishments much good could be accomplished, it was resolved that the moral assistance of every affiliated union be pledged to establish in every part of the country trades unions of these female workers.

Savings Banks and Annuities.

The legislature of Massachusetts, having, mainly at the request of the trade unionists of that State, adopted the savings bank insurance and annuity system, by means of which the wage-earner is enabled to get absolutely safe life insurance at its lowest possible cost, and is afforded the opportunity of securing out of his own earnings, by monthly payments, annuities to make his old age financially independent, and as this system has been put into practical operation, and inasmuch as the expense incurred by solicitors, collectors, high-salaried officials and by dividends to stockholders has been eliminated, and the institution is conducted wholly for the benefit of the insured, the convention realizing its importance and far-reaching influence, by resolution endorses the same and recommends it to be carefully studied and considered by the organized wage-earners of America.

Unemployed.

There being many unemployed men in the country at the present time, a large number of whom have families depending on them for support, and who are denied access to the means of earning a living by the industrial monarchs who own and control the machinery of production and distribution, thousands of these men now being subjects of charity, and are unemployed and helpless through no fault of their own, it was resolved to urge the federal, state and municipal governments to take steps at once to furnish work for the unemployed by constructing schools and other government buildings, by protecting forests and reforesting cut-over and waste lands, by building canals and extending deep waterways, by draining swamp lands, by building dykes and docks, by dredging harbors, by building roads and improving roadways, by any and all means possible, to employ the involuntary idle and suffering of our citizenship, in whom it is the desire to forever maintain the spirit of independence and freedom, tempered with sentiments of justice and love of order that must prevail to preserve a republic of freedom.

Danbury Hatters' Case.

Whereas the United Hatters of North America have been contending with the firm of D. E. Loewe & Co., of Danbury, Conn., for five years to establish favorable working conditions in their factory, the firm having brought suit against the union under the anti-Sherman act for $340,000 and attached the homes and personal savings of 250 of the members of the union, and the Supreme Court of the United States having decided that Loewe & Co. would be entitled to damages if the court finds that the company has suffered loss by reason of the withdrawal of the patronage of organized labor and its friends, the convention pledged its moral and financial support to the union in the pending contention.

Compulsory Arbitration.

The A. F. of L. having for many years advocated voluntary arbitration, and this policy when intelligently employed having proved, in many instances, to be a benefit to the organizations interested, and whereas the Townsend bill which is now pending before Congress purports to be a measure in the direction of compulsory investigation of strikes, but which is really the forerunner of compulsory arbitration with all its evils, the convention expressed its opposition to the principles of compulsory arbitration and recommended that all affiliated unions use every honorable means to apply the principles of voluntary arbitration in disputes between them and their employers.

Industrial Education.

Whereas, Industrial education is necessary and inevitable for the progress of an industrial people, and as at the present time there are two groups with opposite methods and seeking antagonistic ends, now advocating industrial education in the United States, and as one of these groups is largely composed of nonunion employers who advance industrial education under conditions that educate the student or apprentice to nonunion sympathies and prepare him as a skilled worker for scab labor and strike-breaking purposes, thus using the children of the workers against the interests of their organized fathers and brothers in the various crafts, and

Whereas, This group also favors the training of the student or apprentice for skill in only one industrial process, thus making the graduate a skilled worker in only a very limited sense, whch renders him practically helpless if lack of employment comes in his single subdivision of a craft, and as the other group is composed of great educators, enlightened representatives of organized labor and persons engaged in genuine social service, who advocate industrial education as a common right to be open to all children on equal terms to be provided by general taxation and kept under the control of the whole people with a method or system of education that will make the apprentice or graduate a skilled craftsman in all branches of his trade, and

Whereas, Organized labor has the largest personal and the highest public interest in the subject of industrial education, and should enlist its ablest and best men in behalf of the best system, under conditions that will promote the interests of the workers and the general welfare, it was resolved that the president, in conjunction with the Executive Council of the A. F. of L., be authorized to appoint a special committee of at least fifteen, to be composed of a majority of trade union members of this convention, to investigate the methods and means of industrial education in this country and abroad, and to report its findings, conclusions and recommendation to the next annual meeting of the A. F. of L.

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"Binding" an Apprentice in 1769—An "Indenture" That Tells of the Distant Past.

The abuses of the apprentice system as it exists even today in European nations is not tolerated on the North American continent.

The idea that a young person in return for being permitted to learn a trade or business should give his or her "master" (as it is termed in the old country) services of from three to five years free of cost to him and that in addition thereto, as is still compulsory in some cases, parents or guardians should be required to pay the "master" (or firm) a fee, sometimes as high as $125, and even more (and which as a rule they can ill afford) for taking the apprentice to work for them, is grossly unjust and repulsive to Americans and Canadians.

This does not necessarily mean, however, that North American territory has always been free from even the worst form of the apprentice system, as is evidenced by the "indenture" reproduced below under which a girl was "bound" to a farmer for eight years to learn "housekeeping."

The document, which is yellow with

age, has been preserved for over a century in the family of our worthy Second Vice-President, Bro. E. A. Ball, who has kindly permitted its use for the entertainment of our readers. The Albany County referred to in the document is in New York State. The "indenture" is as follows:

This indenture witnesseth that I, Margret Zilner, do bind my daughter, Mary Zilner, to George Dochester, farmer in Albany County on the Mohack river by and with her own consent after the maner of an aprentice to learn house keeping and all other nesserryes what belong to the said house keeping to serve from the day the date hereof for and during the term of eight years and fore months and next insuing, during which term the said aprentice her said master and mistriss faithfuly shall serve; his secrets keep and all his lawfull commands every where gladly do. She shall do no damage to her said master or mistriss nor see it done by others without leting or giving notice thereof to her said master or mistriss. She shall not waste her said master's goods nor lend them to any unlawfully. She shall not contract matrimony during the said term. She shall not play cards, dice or any unlawfull games where by her said master or mistriss may be damaged with his own goods nor the goods of others. She shall not absent her self day nor night from her said master or mistriss service unlawfully nor haunt ale houses, taverns or play houses, but in all things behave her self as a faithfull aprentice in the trade or mistry she now foloweth and her said master shall procure and provid for her sufficient meat, drink, apperl, lodging, washing and all other nesserreys during the said term. her said master shall give her the said aprentice upon her freedom day one new sute of close and one young cow & one sheep and one spining wheel and to learn her to read and for the true performance of all and every the said covenents and agreements either of the said parties bindeth himself unto the other firmly by these presents in witnes whereof they have inter changebly set there hands and seals hereunto this 26 day of Sept. in Ninth year of the reign of our Soverrign Lord George the third by the grace of God, king of Great Brittan France and Irland Defender of the Faith in the year of our Lord One Thousand Seven Hundred and Sixtynine 1769.

Signed Sealed and delivered in the presence of w..........

N. B. It is further agreed that if hur said mother shold be sick & not able to help hurselfe then the said George Dochsteter shall allow his said aprentice to take care of hur said mother for a week or two at a time.

John Watters
hur
Margret X Zelner
mark

hur
Marey X Zelner
mark

Sand Flatts 27th day 1778. This is to certify that the within mentioned Mary Zilner has served me the within mentioned time honestly, soberly and faithfully as witness my hand.

his
George ‡ Dochsteter
Mark

William Gilles
his
Benjamin X Freylich
Mark

◆ ◆ ◆

The American plutocracy has passed sentence on Gompers, Mitchell and Morrison, and believes that it has sufficient control of the government to put the sentence into execution. HAS IT?

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*Solving the Labor Question.**

Shall we abolish the labor union, hoping thus to solve the labor question? Common sense and practical experience say no. The trades union has become a fixture in our industrial life. It has come to stay. It is simply a question as to whether it will be a good unionism or a bad unionism. If in various ways good workingmen are to be deprived of their membership in the trades union it will result in a bad unionism, because the unscrupulous will thus be left in control. But if, on the other hand, the best employes are encouraged to identify themselves with this movement it will result in a good unionism. It would seem to be the part of wisdom then to develop and not to attempt to destroy the trades union.

Furthermore, those who seek to destroy the trades union, hoping that thereby they will solve the labor question, forget that trades unionism is not the labor question. It is simply one of the expressions of the labor movement. It is not the cause of industrial agitation but the outcome of it. If every labor union were to be wiped out today the labor question would still be with us, and probably in a more aggravated form. The trades union will not be destroyed until something better takes its place, and the better system will come as a further result of the evolution which produced the trades union.

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*By the Rev. Charles Stelzle.

It is supposed by some that socialism will eventually supersede trades unionism. It is altogether likely that socialism will play a prominent part in the world's industrial drama, but socialists must not flatter themselves that because a change in our economic system is probable, therefore socialism must necessarily become the prevailing system. In the end there will be not one answer to the social question, but many, but they will all agree in this: all of them will be religious. The social question is fundamentally a moral and a religious problem. It will never be settled upon any other basis. Because this is true the church will have an important part in its solution. The church must have a clear message with reference to the principles involved. The preacher need not discuss social theories, but he must present in the spirit of the prophet the supreme laws of love and justice and service, and apply them to present day questions. He should speak with no uncertain sound concerning the evils of child labor, of the unsanitary conditions in sweat shop and home, of the curse of Sunday labor and everything else that is preventing the masses from living the abundant life which Christ came into the world to give them.

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Efforts are being made to perpetuate government by injunction and destroy trial by jury.

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Killed and Injured by Separation of Engine and Tender.

In reply to inquiries received at this office for information as to the number of employes who have been killed or injured by reason of engine and tender separating during recent years, we publish the following special statistics furnished us at our request by the Interstate Commerce Commission, and which cover a period of eight years from June, 1901, to July, 1908, inclusive:

YEAR.	Engineers.		Firemen.		Trainmen.		Total.	
	K.	I.	K.	I.	K.	I.	K.	I.
1901........	....	....	1	3	....	....	1	3
1902........	....	2	3	6	1	3	4	11
1903........	1	....	1	16	2	6	4	22
1904........	....	....	6	21	2	6	8	27
1905........	....	1	4	14	....	6	4	21
1906........	1	1	2	19	....	3	3	23
1907........	....	2	5	23	1	8	6	33
1908........	..	....	2	6	....	....	2	6
Total...	2	6	24	108	6	32	32	146

Note: K—killed. I—injured.

As will be noted from the foregoing, the number of locomotive firemen killed and injured from this cause is largely in excess of that of engineers and trainmen, and is easily accounted for from the nature of the fireman's duties which require him to be almost constantly employed between the engine and tender—directly over the treacherous coupling—and with less than one chance in a hundred of saving himself from a horrible death should the connection between engine and tender give way.

An instance which comes forcibly to mind and within the knowledge of the writer occurred a few years ago on a certain railroad in a northern state. It was the case of a passenger engine which frequently and unexpectedly separated herself from the tender, generally taking the draft rigging with her. On this engine the front and rear coupler castings were secured to the tender frame by means of long rods from one to the other and fastened with nuts. These nuts, together with portions of the rods, would pull off. Whenever this happened, and there was a freight car in the vicinity, the engineer and fireman would proceed to jack up said car and rob the trucks of their column bolts, which were just the right length to bolt each casting independently to the tender frame. However, they were smaller in diameter than the original rods, and after going a few miles would break off, when the operation would have to be repeated. The fireman after a few such experiences got "wise" and would jump from engine to tender and back again, making it a rule to stand with both feet on the deck of the engine when putting in a fire. This, of course, was when small engines were the rule, and would be difficult to do with the modern engines generally in use today.

* * *

*Railroad Labor Interests in the Courts.**

Duty to Provide Safety Appliances.—Scott Jones, an engineer in the employ of the Yazoo & Mississippi Valley Railroad Company, was fatally injured by the derailment of an engine he was operating, caused by striking a cow on the track; the body of the animal passing under the wheels of the engine, and causing the engine to leave the track while the train was going around a very short curve. In an action by his minor children to recover damages for his death the declaration alleged negligence on the part of the railroad company, in that (1) the engine which was being operated by Jones at the time of the accident was equipped with a kind of cowcatcher known as a "stub pilot," with a stationary coupling bar, that this pilot was shorter in length from heel to toe than it should have been, and that the stationary bar of the coupler constituted an obstruction, and interfered with the throwing off of the track the objects struck by the engines, and that this pilot and coupler were dangerous, unsafe and defective; (2) that the conditions above set out had been called to the attention of the railroad company by complaints from the Brotherhood of Locomotive Engineers, to which Jones belonged, and that the company by its officers had promised to substitute safer and less dangerous appliances. The railroad company denied that any promise had been made to substitute any other kind of pilot or coupler, and denied that the kind in use on its engines was dangerous, unsafe, or defective, but, on the contrary, was the standard pilot in use on the largest railroad systems throughout the United States, and that in using the same it was not guilty of negligence or failure of duty, and therefore not liable for the injuries of the engineer. After hearing the evidence the court gave a peremptory instruction in favor of the company and the plaintiffs appealed.

The opinion of the Supreme Court of Mississippi affirming the lower court is in part as follows:

"We think the action of the court was proper. The facts proven did not warrant a recovery. The use of the appliance by the railroad, which it is claimed was defective, and by reason of which it is alleged that Scott Jones lost his life, is one in universal use and approved by the experience of a number of railroads, and in itself is not defective or unsafe. The change desired in the appliance, which it is contended the railroad company promised should be made, if it be conceded that the facts show there was a promise, was not a defect called to their attention, and a promise to repair a defect existing in the appliance, but was a promise to change from a safe to a safer appliance. In all the cases cited by the learned counsel for appellant, the facts show, where there was a promise to repair and the master was held liable, it was a promise to repair an existing defect, admittedly so. The proof in this case utterly fails to show that the pilot in use was in any sense a defective pilot. In the language of the case of Hatter v. I. C. R. R. Co., 69 Miss. 642, 13 So. 827, 'to hold the employer liable for the injury sustained would, as it appears to us, be to declare that railroads are responsible for injuries to their servants in all cases in which the safest appliances in use are not secured by them.' We cannot so hold."

43 So. (Miss.) 813.

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Assumption of Risk—Damages.—D. A. Middleton was a Texas & New Orleans Railroad Company engineer on a passenger train running from Houston, Texas, to Lafayette, La., and while on one of his trips was injured at Beaumont, Texas. The negligence alleged as the cause of his injury was that the company's employes who were engaged in operating another engine negligently caused and permitted the same, unawares and without warning, to collide with great and unnecessary violence against the train of cars and locomotive engine on which plaintiff was standing, and to violently move and suddenly stop same, in the operation of which Middleton was engaged at the time; that in the collision and in the jerking of the engine and train, and in the sudden moving and stopping of same and on account thereof, Middleton was thrown with great force and violence against a "sand box, and one or more of his ribs driven in and broken, and dislocated and detached from the breast bone, and he was otherwise injured in and about his breast, back, heart and lungs, said injuries being of a serious and permanent character." In an action against the company to recover damages for the injuries Middleton recovered a judgment for $10,000.

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*Prepared for the Locomotive Firemen and Enginemen's Magazine by Geo. H. Murdoch, Jr., New York, N. Y.

On appeal the Texas Court of Civil Appeals affirmed the judgment and in substance held:

1. The rule that an employe assumes only risks ordinarily incident to his employment, but not such as are created by the master's negligence, and of which he does not know, and is not bound to anticipate such dangers, applies as well to an engineer or other employe on a train, as to one working with tools or machinery.

2. A verdict of $10,000 for injury to a locomotive engineer, 44 years old, earning $1,800 a year, permanently disabling him from pursuing his occupation, and otherwise causing him trouble, is not excessive.

3. An instruction in a personal injury case that, if verdict is for plaintiff, he is entitled to recover compensation for the injuries proximately resulting to him from the casualty, including, if such injuries are permanent, such consequences as the evidence may show have not yet actually ensued, but reasonably and probably will, and, in measuring any damages plaintiff has so sustained, the jury will consider, so far as shown by the evidence to result from such injuries, naturally and probably, the reasonable value of the time lost to plaintiff down to the trial, if any, consequent on such injuries, and the reasonable sums expended by him, or for which he has incurred liability, for necessary medical attendance and medicine, if any, and the physical and mental pain, if any, consequent on such injuries, including such, if any, as he will reasonably and probably suffer therefrom in the future, and if the jury believe from the evidence that such injuries sustained by plaintiff, if any, are permanent and will disable him to labor and earn money in the future, they will, in addition to the above, allow him such sum, if paid now, as will be a fair and just compensation to him for his future diminished capacity and labor—is not confusing.

103 S. W. (Tex.) 203.

Peculiar Facts.—An engine drawing thirty-one loaded cars stopped at a station to permit the unloading of freight from one of them, and the fireman, with the knowledge of the engineer, stepped out for the purpose of crawling under the engine and raking the ashes out of the ashpan. It was dangerous to the fireman to move the engine while he was under it. He crawled under it, and, as he was about to commence to rake out the ashes, the engine moved backward: he placed his hands upon the rail and jumped out, but before he could remove them one of the trucks passed over and crushed his left hand. The engine moved from two to four feet. There was evidence that the backward movement of the engine was caused by the recoil of twenty-four cars on the rear of the train, the air brakes upon which were not in operation; that when the train stopped these cars ran up against the engine and the seven cars in front of them, and then rebounded, the slack ran out, and then pulled the engine back. The engineer testified that he set the air-brakes, stopped the train in the ordinary way, and set his lever at the center notch; that, when the engine started back he could not hold it, and he gave it steam; that, if he had not applied the steam the engine would have gone back the length of three or four cars, and that during all this time the air was set and the brakes were on. There was also evidence sufficient to sustain a finding by the jury that the backward motion was caused by the engineer by giving the engine steam while the lever was in the backward motion.

The United States Circuit Court of Appeals for the Eighth Circuit *held* that the case was properly submitted to the jury, because, if the engineer caused the backward movement by giving the engine steam while he knew the fireman had gone to crawl under it, he was guilty of negligence, and the evidence was not conclusive that the fireman was guilty of contributory negligence.

Chicago, M. & St. P. Ry. Co. v. Heil, 154 F. 626.

Mental Anguish.—Serious and continuing bodily injury will support a finding of mental anguish.—Galveston, H. & S. A. Ry. Co. v. Parish, 100 S. W. (Tex.) 1175.

Fellow Servants.—A flagman who had been instructed to obey the orders of conductors and engineers while the conductors are in charge of trains, while obeying the orders of such conductors is a fellow servant of the engineer's.—Lyon v. Charleston & W. C. Ry., 58 S. E. (S. C.) 12.

Contributory Negligence.—Where an employe of a railway places himself on the track in a position of danger, without any emergency or exigency therefor, he is guilty of negligence, and cannot recover for injuries received, even if defendant were negligent.—Caffi v. New York Cent. & H. R. R. Co, 102 N. Y. S. 633.

Automatic Coupler.—A shovel car is a "car" within the meaning of the act of March 2, 1893, section 22, requiring any car used in moving interstate traffic to be equipped with an automatic coupler.—Catherine Schlemmer v. Buffalo, Rochester & Pittsburg Railroad Company, 27 Sup. Ct. R. 407.

Disobedience of Orders.—Where the engineer and conductor of a train on which decedent was fireman received orders to pass a certain other train on a specified siding, and those in charge of decedent's train saw a locomotive thereon, and, taking it for granted that it was the locomotive of the other train, ran by and collided with the other train just beyond the siding, no recovery could be had for the death of decedent.—Hayes v. New York, N. H. & H. R. Co., 105 N. Y. S. 592.

Damages Not Excessive.—Nine thousand three hundred and thirty-eight dollars and sixty cents was not an excessive verdict, where plaintiff's leg was amputated half way between the foot and the knee; he was at a hospital seven weeks, suffered great pain, and had many bed sores, and after healing the stump of the leg continues to cause him great pain, and he has difficulty in wearing an artificial leg; he being 45 years old, and having before the accident had good health and been able to do all kinds of manual labor.—McCoy v. New York Cent. & H. R. R. Co., 103 N. Y. S. 1083.

Employer's Liability Act.—In an action against a railway company for the death of an employe, caused by the movement of a train while he was between it and a box car on a side track, plaintiff failed to make out a case under Employer's Liability Act, Code 1896, section 1749, subd. 2, making employers liable for injury to servants negligently caused by any person in the master's service having superintending control, etc., where the train was started in response to a signal given by a baggagemaster, as to whom there was no proof that he had superintendence or control of the train, nor facts from which it could be inferred. Southern Ry. Co. v. Shook, 43 So. (Ala.) 579.

Release.—Const. Wyo. art. 10, §4, provides that any contract or agreement with any employe waiving any right to recover damages for causing death or injury to any employe shall be void. Article 19, section 1, provides that it shall be unlawful for any corporation to require of an employe any contract whereby the corporation shall be released from liability on account of personal injuries received by the employe by reason of the negligence of the corporation or the employes thereof, and that such contracts shall be void. *Held*, that it having been contemplated at the time plaintiff's intestate executed in this state a release of liability to an express company of both itself and defendant railroad company by both of whom the intestate was employed that part of his services was to be performed in Wyoming and the injuries having been inflicted while intestate was engaged in the performance of those services in Wyoming, the release was to be deemed a contract of that state, and as such was void.—Stone v. Union Pac. R. Co., 89 P. (Utah) 715.

Action for Injury on a Leased Road.—Henry K. Baker was a locomotive engineer, employed by the Central Railroad Company of New Jersey. At the time of his death his engine was hauling a train of freight cars for that company from Jersey City to Philadelphia. The latter portion of the run was made under a traffic arrangement with the Philadelphia & Reading Railroad Company over the tracks of that company. After Baker's train approached Tabor Junction, he was signaled by the Philadelphia & Reading towerman to take the southbound track of that company. While running thereon, at a point south of the signal tower, Baker's engine struck the engine of a local freight train of the Philadelphia & Reading Company, which was passing from the south- to the northbound track. This Reading train had not only no right on the southbound track at the time, but it violated the rules of that road in having no flagman out to warn approaching trains.

Baker was killed in the collision, and his mother brought an action for damages on account thereof against the Philadelphia & Reading Company. She recovered a verdict and judgment in the Circuit Court of the United States for the Eastern District of Pennsylvania, which was affirmed by the Circuit Court of Appeals, Third Circuit.

Pennsylvania has a statute, enacted in 1868, which provides, "That when any person shall sustain personal injury while lawfuly engaged or employed on or about the road, works, depots and premises of a railroad company, or in or about any train or car therein or thereon, of which company such person is not an employe, the right of action and recovery in all such cases against the company shall be such a one as would exist if such person was an employe, provided that this section shall not refer to passengers."

The Reading road set this statute up as a defense, contending that under its provisions Baker was to be held as an employe of that road, and hence the negligence of its employes would be that of his co-employes, and for this the company was not liable.

The court held that inasmuch as the defendant company had at the time and place of this accident no right whatever to occupy this track, and that it was guilty of negligence in obstructing the passage of the train to which Baker's engine was attached, the statute had no application.

Philadelphia & R. R. Co. v. Baker, 155 F. 407.

Co-employes—Assumption of Risk—Damages.—Tom Walton was in the employ of the Texas & New Orleans Railroad Company as engineer in charge of one of its switch engines. J. M. Greer was the fireman, and they were engaged in switching and shifting freight cars in defendant's yards. About noon they stopped the engine at a water tank to take water. It was the hour when the switching crew usually took lunch, and some of them were so engaged. The fireman, however, proceeded to fill the tank with water, and the engineer got down from the engine and was engaged in oiling its various parts. While so engaged the fireman returned from the tender to the cab and opened the blow-off cock to clean out the boiler. It was customary for him to do this every day or two, when so directed by the engineer, the latter being the judge of when it was necessary and the fireman being under his orders. On this occasion there was a steam pressure of 150 pounds to the square inch, a pressure sufficient for the operation of the engine. The valve was opened just as Walton was passing. He was enveloped in steam. The steam and hot water was thrown against his leg, producing a deep burn from the lower part of his thigh to the calf of the leg. The force threw him off his feet. He was in fair health and in possession of normal senses up to the time of the accident. Walton was badly injured and later sued the company to recover damages therefor. In the District Court of Harris County he recovered a verdict for $5,000, from which the company took an appeal.

The judgment was affirmed by the Texas Court of Civil Appeals, which said in part:

"There was evidence sufficient to sustain the finding that the serious injury to his eyesight, the loss of hearing in his left ear, and his present inability to walk without crutches are due to the accident, and that his injuries are serious and permanent. He was earning at the time from $80 to $120 per month. The statute (Rev. St. 1895, art. 4560) defining who are fellow-servants, exempts the operatives of a railroad engine from the fellow-servant rule, while they are engaged in their work. Defendant's contention that, under the facts of the case, the fireman and engineer were fellow-servants at the moment of the accident, is rested upon the fact that the engine was at rest, and not in operation, and that each was engaged in preparing it for further operation.

"Defendant seeks to apply to the facts of this case the rule announced in the case of Railway v. Howard, 97 Tex. 513, 80 S. W. 229. In that case the person injured was an engineer, who, when injured, was on his way to the engine for the purpose of taking charge of it. Two other employes under his general control and supervision negligently ran the engine against him, and killed him. It was held that the statutory exemption applied only when the employes were actually engaged in the extra hazardous work of operating the engine, and that one on his way to such work was not within its protection. The conclusion of the court was that deceased was a fellow servant of those in charge of the engine. Medberry v. Railway Co., 106 Wis. 191, 81 N. W. 659, a Wisconsin case, is cited with approval, in which it is held, under a similar statute, that a conductor who had not yet taken charge of his train, but was standing by awaiting the removal of some bundles before the train could be started, was not within the exemption. But in neither of these cases was the court called on to make a distinction between the work of actually moving or stopping an engine and the work of the operatives during a pause to take water and oil the machinery. In discussing the question disposed of in the Howard case, *supra*, Justice Brown uses the following language: 'If Howard had been upon the locomotive, or had been working in connection with it for the purpose of moving it into the roundhouse, the case would come within the terms of the statute.' This expression directly supports the conclusion we have reached, and the principle upon which it rests excludes the idea that there is room for the distinction insisted on. The statute in question was designed for the protection of those engaged in a peculiarly dangerous calling; and its application alone to railway corporations is justified only upon that ground. That these dangers do not end the moment the engine is at rest is a manifest fact, of which the case is an illustration. And this is true both as to the fireman and engineer. The fireman might be engaged in adjusting the apparatus by which water is taken into the tank. Should the engineer without warning suddenly move the engine, it would seriously endanger the fireman. The engineer of a passenger train traveling rapidly between stations might find it necessary to stop his engine and adjust some of its parts. This duty might require him to get under the engine, and while so engaged the fireman, while engaged in his duties, might carelessly strike the lever and start the train. It could not be fairly said that the statute was not designed to cover such a case. The facts supposed are within the spirit of the law, and are not to be distinguished from the facts in the case at bar.

"Appellant presents the further point that defendant is not liable for the act of the fireman, because it was alleged and proved that he had no authority to open the valve of the blow-off cock without express instructions from the engineer. We construe the allegations and proof to mean that it was a part of the general duty to open the valve: but when it should be done was within the discretion of the engineer. The fireman in contradiction of the plaintiff, stated that he had been instructed to open it that day. We do not think that by either the allegation or the proof is the case brought within the doctrine of those cases which hold that a railway company is not liable for the ejection of a trespasser by a brakeman unless directed so to do by the conductor. There he derived his authority to do the act from the conductor and did not have it otherwise. Here the act complained of was a part of the general duty of the fireman; the engineer determining when it was necessary.

104 S. W. 415.

Negligence.—John Quinn brought a personal injury action against the Galveston, Harrisburg & San Antonio Railway Company, and recovered a judgment for $12,000, which has just been upheld by the Texas Court of Civil Appeals. The facts shown on the trial were as follows:

Quinn was the engineer on a regular through transcontinental train, known as the "Sunset Limited," which was a long, heavy one, consisting mostly of sleeping coaches. It was a fast train, and was on its way from California east. When the train reached Spofford it was over three hours behind the schedule time and Quinn was there ordered to make up fifty minutes of the lost time between that point and San Antonio. From Spofford to San Antonio the fast train was known as "Second No. 10;" another train known as "First No. 10" having been made up at Spofford and having left that point one hour and fifty minutes ahead of Quinn's train. The first train was to make up fifty minutes also, the apparent desire being to keep the two trains separated by one hour and fifty minutes. The first section, however, lost time from the start, and at Lacoste station, where the collision occurred, it had so fallen behind that it was seven or eight minutes on the time of the rear train. Under its running orders the rear train had the right to pass Lacoste at 9:48 o'clock p. m., and it actually reached Lacoste at or about 9:57 p. m., and ran into the rear of the front train, and Quinn was badly injured.

The train dispatcher knew the position of the trains, knew that the "First No.

10" was running behind and "Second No. 10" about on time, and yet no warning whatever was given the second train, nor any provision made for the trains passing each other. Quinn swore that before getting to the whistling post, which was seven-eighths of a mile from the station at Lacoste, he blew his whistle, shut off steam and moved on a down grade toward the station. About half-way between the whistling post and the station he applied the air and reduced the speed to eighteen or twenty miles an hour, then gave four blasts of the whistle for orders, and reduced the speed to about twelve miles per hour. He swore that he could not see the semaphore when one-eighth of a mile from the station on account of a water tank which obscured its view; that he then saw a white light, which he answered at once, and instantly saw a red light, a danger signal, and threw on the emergency brakes, and in an instant crashed into the caboose on the rear of "First No. 10," which train was standing on the track. The rear train was running on its time, and, although it had the right of way, no red lights were displayed at the rear of the caboose, and no other warning or signals were given. The rear train was not required to stop at Lacoste. Quinn testified that he had his train under control and used all means within his power to prevent the collision, after he saw the danger signal, but it was given so late that he could not prevent the collision. He also swore that the brakeman with the red light, which first gave him notice of the danger, was not at the rear of the train but was down near the station. The rules of the company required that when a train was stopped or was delayed, as was "First No. 10," a flagman must go back and give stop signals to a train following, so as to insure protection. That rule was disregarded by the employes of the first train. It was also the duty of the front train to put on the track certain contrivances known as "fusees," which would burn red for about ten minutes and then green, and would inform those on the rear train of danger ahead. That rule was also disregarded. It was also the duty of the employes of the first train to have red lights on the rear of their train, and that duty was not performed.

The court held that the collision occurred through the negligence of the employes on the first train and that there was no negligence on the part of Quinn.

104 S. W. 397.

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SPIES AND TRAITORS

One of the principal evils with which labor organizations have at present to contend is the insidious operations of the labor spy.

His presence in the movement constitutes an acknowledgment on the part of its enemies that desperate measures must be resorted to if the onward march of organized labor towards the successful attainment of its aims and purposes is to be checked.

For some years past rumors have prevailed to the effect that "industrial detectives" were to be found amongst the membership of organizations of labor. It was known that "detective agencies" existed that supplied spotters for this class of work who furnished "reports of labor union meetings and of the movements of their members" at regular intervals to manufacturers and other extensive employers of labor.

It was generally understood, however, that these institutions were preying on the gullibility of the employing interests, whom they succeeded in convincing that the information they supplied was of some real value and could not be obtained unless through the medium of "industrial detective" concerns like themselves, although but little of it was in any sense secret. Hence for a time organized labor attached but little, if any, importance to them.

Manufacturers' Association in the Spy Business.

Developments that are comparatively recent, however, make it clear that the labor spy industry is no longer monopolized by these "industrial detective bureaus," as it has been proven beyond question that the Manufacturers' Association itself has for some time past been maintaining a very extensive spy system as a factor in its bitter warfare against organized wage-earners.

Some of the spies of that organization serve also as agitators who in their dual capacity as members of the unions and agents of the Manufacturers' Association provoke trouble when the union is not prepared for it, and thus help to precipitate unsuccessful strikes.

These wretches also make up lying reports for their employers when occasion requires it so as to impress them (the employers) with their usefulness. It matters not how absolutely false or diabolical the statement may be or to what extent it injures the working man constituting the subject of it, if it suits the spy he never hesitates about using it.

Thus it is that railroad conductors wholly innocent of all wrong doing are dismissed from positions they have held nearly a lifetime and are turned out at an advanced age to face the world with their character besmirched, and as a consequence with no hope left to secure employment at probably the only occupation with the duties of which they are familiar.

It is claimed by those who profess to know—and their claims are supported by actual occurrences—that amongst the spy hirelings of the National Manufacturers' Association, as well as of certain Secret Service agencies having railroad companies amongst their clients, are to be found trusted employes of international headquarters of labor organizations who endeavor to keep either certain employing interests direct, or their particular secret service agency or "detective bureau" in touch with the confidential business affairs of such headquarters, and who co-operate with local spies at points where labor trouble exists or is liable to develop in endeavoring to wreck unions and break strikes. In addition to their other spy operations these fellows steal letters and other important documents, take copies or photographs of them, return the letters and documents to the files and send the copies or photographs to the employing concerns or detective bureaus, as the case may be.

Connivance of the Press.

That the existence of this "industrial spy" system is not a matter of more extensive public knowledge is due to the fact that nearly all of the newspapers of the country outside of the labor press are in one way and another controlled by the money power, in which the National Manufacturers' Association and other employing interests constitute such a prominent factor. Besides, owners of newspapers themselves are employers, and generally speaking not in sympathy with organized labor. Consequently, reference to this nefarious spy industry is, of course, excluded from their columns, which silence on the part of the press the better facilitates its operations.

They Seek to Destroy Private Character.

The heinous methods employed by the Manufacturers' Association's spy bureau to wreck labor organizations show the diabolism to which greed will impel some men to resort, for in addition to attempting to destroy the organizations themselves they seek also to ruin the character and standing of their officials, in the hope of thus shaking the confidence of the rank and file in their leaders and creating discord and dissension in their ranks.

Attempt to Bribe President Gompers.

President Gompers of the American Federation of Labor submitted to the 1907 convention of that organization a special report on this subject, revealing not only the base tactics of this spy system, but as well an attempt that was made by an agent of the Manufacturers' Association to bribe Brother Gompers himself to turn traitor to organized labor. In his report President Gompers expresses himself in part as follows:

> Public sentiment will be shocked at the revelation of the methods employed by the spies and agents of the Manufacturers' Association. I shall lay much of this information before you and the general public.
>
> The unions of the country have been simmering with resentment since I informed them through the American Federationist of the real purposes for which the Manufacturers' Association's million and a half dollar war fund was to be used. I published an editorial in the American Federationist last July and another in September stating that the fund would be used in an attempt to vilify and

discredit the officials of our movement—that detectives and spies were already swarming around our unions, not only trying to get information, but busily engaged in fomenting trouble and concocting lies as to the actions of such unions and their members. My editorials were based on actual information. A symposium in our September issue, contributed by our most prominent labor officials, showed that they, too, realized the character of the fight against us. This recent attack upon the officers of the A. F. of L. is the proof to our members of how accurately we foretold the action of the National Association of Manufacturers. They have made a very poor job of it.

A Sample of Their Methods.

Continuing, President Gompers told how an agent of the Manufacturers' Association, after seeking to win his confidence, had undertaken to induce him with a bribe to betray organized labor. This agent, in the course of his first conversation with the Federation's president, said:

The purpose of my coming to see you is of the utmost importance to us. I am in charge of a certain bureau of a department organized for the National Manufacturers' Association. The purpose of it is to expose the immorality and the dishonesty of the leaders in the labor movement and to make it public.

While I do not want to express in specific financial terms what the National Association of Manufacturers is willing to do, yet I can guarantee that you will be finacially safe for the balance of your life. All that you need to do is to give us the information which we want of the other men, and to give us the workings of the inner circle of your council and the general labor movement.

We do not want you to get out of the presidency of the Federation at the forthcoming convention, for the Manufacturers' Association does not like Duncan any more than they do you. They realize that if you were to get out now it would mean that he would be your successor; but in a month or two after your re-election at Norfolk, you can get out, and the publication of all of these matters in regard to the active men in the labor movement would destroy them, and they would have to get some nobody to be president, and then there would be little Federation left.

In his effort to convince me, said President Gompers, that he was an authorized agent and representative of the National Association of Manufacturers he showed me vouchers and warrants and receipts for money paid to him as its agent. The warrants and vouchers and receipts were in printed forms of the Century Syndicate, No. 1 West Thirty-fourth street, New York City, also printed thereon that it was a bureau or department of the National Association of Manufacturers.

There is in my possession further information of the ramifications and machinations of the National Association of Manufacturers, their detective agencies, their auxiliary companies, and the reptile hirelings who are employed to assassinate the character of the men of labor and thereby hope to weaken or destroy the labor movement of our country. All that I now desire to add is that there is not a scintilla of truth in anything published or which can be published by the National Association of Manufacturers or their hirelings which in any way can reflect upon the integrity, the morality or the honesty of myself, and I have an abiding faith they can not do so of any one member of the Executive Council of the American Federation of Labor. I defy our enemies to do their worst.

Would Freely Slander.

At this point Vice-President Duncan said:

I want to remind President Gompers of one thing he has omitted to recount. This mysterious man, in addition to his information about the purpose of collecting alleged data about the characters of the men connected with the labor movement, added that if it could not be found he proposed to manufacture it. I say this because of its importance and because in their newspapers they will continue to publish stuff purporting to be a record of the private lives of the men. The statement is important, because it was given to President Gompers with considerable emphasis.

Continuing, President Gompers said:

It is true that statement was made. There is not a word in the statement I have made this afternoon that is not a conservative statement of the facts. It was made conservative in order that I might be absolutely within the truth. Realizing the importance of making the statement, I had a consultation with Vice-Presidents Duncan and Huber, and they asked me to write it down as soon as possible after I returned to Washington. In spite of that, this very important statement was overlooked. Mr. Brandenberg said: "They are determined to destroy the men at the head of the labor movement, and particularly yourself, unless we can get you. We have men who have made affidavits, men you have trusted in the labor movement, who have been national officers, and who have had your confidence. If the information we have or can find is insufficient, we have got the bureau that can and will manufacture it."

I could stand before you another hour and tell of these things. I could tell you of men whose names have been given who are in the employ of the labor organizations, who are also in the pay of the Farleys, the Farrells, and this Century Syndicate, all of them either agents of the National Manufacturers' Association, or auxiliaries and companies formed by it for the purpose of destroying the men in the labor movement. In all the history of the labor movement in any country on the face of the globe, in all the world, I do not believe that any coterie of the worst representatives of the capitalistic class have been so cruel, so brutal, so malignant and conscienceless as these Van Cleave hirelings have shown themselves to be.

Incidents strongly tending to corroborate President Gompers' statements have, to the knowledge of the writer (the Editor), transpired during the recent past in the headquarters' offices of a certain labor organization which, in all probability, will be made public as soon as the judgment of its general officers so direct.

How the Labor Spy Should Be Dealt With.

In warfare the punishment of the spy is death. From such a sentence there is little if any hope of commutation or reprieve for the accused once the charge is proven. Yet in such a case an element of patriotism enters into the act—a willingness on the spy's part to risk his life in the advancement of his country's cause—and this constitutes a sort of moral mitigant.

If, under such circumstances, spying is so reprehensible, how depraved the wretch who serves in the double role of spy and traitor, particularly in the organized labor movement—the conscienceless scoundrel who, by his nefarious machinations, seeks to destroy the efficacy of united action amongst wage-earners in defending their common interests and who thus helps as far as he can to bring misery and want to them and their loved ones?

The sneaking coward who thus attempts to weaken the protecting hand of organized labor and endeavors to leave its members and their families easy victims to all the injustices and wrongs against which it guards them, is a living libel on humanity, who, by his vile presence, desecrates the earth and defiles the fair face of nature herself.

To the reptiles who secure employment in the offices of labor unions or brotherhoods for the purpose of betraying the secrets of those organizations to their enemies, no mercy should be shown.

Once having been proven guilty their pictures, together with accurate descriptions of them, should appear in every labor publication throughout the length and breadth of the land. From the moment their actions first arouse suspicion their movements should be closely watched for the double purpose of frustrating their plans and securing evidence upon which to prove their guilt.

A Traitor's Punishment.

Last June a French naval officer was convicted of having sold some of his country's naval secrets. The following press dispatch tells of how he was punished for his crime:

Paris, June 12.—A dramatic scene took place today, when Ensign Charles B. Ullmo, convicted of attempting to sell stolen naval documents, was publicly degraded. Before a great crowd that hissed him, Ullmo's sword was taken from him and broken and the braid and buttons were torn from his uniform. Though Ullmo had confessed his guilt, he was deeply affected by the punishment. The police were prepared for an outbreak, but aside from the hissing no demonstration was made.

Ensign Ullmo was arrested at Toulon last October, charged with being a spy. An examination of his effects showed him to be in possession of many valuable documents. Last February he was found guilty by a court-martial and sentenced to life imprisonment in a fortress and to be degraded in rank.

Train excursions were run and thousands of people from the surrounding country came in to witness the ceremony. They packed the sidewalks and covered the adjacent roofs, walls and ramparts. The pressure of the crowds was so great that it threatened to sweep away the lines of soldiers and sailors drawn up around the square.

PUBLIC DEGRADATION.

After the troops had been reinforced with two lines of regiments, a battery of artillery and two squadrons of cavalry, Ullmo, wearing his uniform and sword, was led into the rectangle, where the commandant read the order that Ullmo had betrayed his country and was not worthy to wear its uniform. Two subalterns then took off his sword and stripped him of his chevrons and buttons. One of the subalterns broke the sword across his knee and threw the broken blade at Ullmo's feet.

In this plight Ullmo was compelled to march at the head of a squad of soldiers around the rectangle amid the hoots and jeers of the crowd. He walked with his bared head sunk on his breast and his eyes staring straight in front of him. Tears were streaming down his face.

Several thousand recruits who witnessed Ullmo's degradation were greatly impressed by the ceremony. Ullmo will be deported to Devil's island, off the coast of French Guiana.

The man who, realizing what organized labor's mission is—that it is the only power that shields the wage-earner and his family from cold-blooded, merciless avarice—and who, under an obligation to advance its interests and promote its well-being, will wilfully endeavor to betray it by placing its secrets and confidences in the hands of its enemies, is deserving of as severe punishment as this French traitor who sold his country's naval secrets to a foreign power.

While organized labor can neither imprison its traitors for life nor degrade them with a public ceremony as was this traitor to France degraded, it can so hold them up as objects of public ignominy and scorn as to make them outcasts while on earth—objects of the reproof and contempt of honest men and women—and this it should do in each and every case.

* * *

It devolves upon the American wage-earner to save our free institutions. It seems that the plutocracy intends to further tighten its grip on the throats of the people and to gradually convert the republic into a plutocratic oligarchy.

* * *

Something About Coal Briquets.

For some time the Geological Survey Department of the United States Government has been experimenting with coal briquets with a view to obviating the great waste represented in the discarding of slack. These briquets which are made in the form of bricks or balls, are manufactured by mixing the slack with pitch or some other cohesive and inflammable substance, and compressing it into these forms. The Survey Department has been making some tests with these briquets in order to determine whether or not they could be used to advantage as fuel for heating boilers in private houses. The experiments were conducted by Mr. D. T. Randall, whose report appears in a "Survey Bulletin." It would seem as though Mr. Randall was not very favorably impressed with the future of coal briquets as fuel, for, in concluding his report he says:

"On comparing the results of tests on the coal and briquets there seems to be no advantage in the briquets over coal of a suitable size for the house-heating boilers. Briquetting a good bituminous coal would be justified only when slack is used for material, and the gain from briquetting would lie almost entirely in the more favorable size of the fuel. This gain would be less for coals that coke readily than for noncoking coals or for coking coals that are not suitable for domestic purposes in the form of slack. Briquets made from such coal burn fairly well, as they allow the air to pass up through the fuel bed."

* * *

The Rules of the Game.

They have "studied the problems of slum life"
(A venture which brought them renown),
Though the blood and the sweat
And the smells that they met
Drove them back to their homes uptown.

They were seized with a fainting sensation
As they passed up in filth without name;
But they thought that they knew
What "the masses" pass through
In keeping the rules of the game.

Not a laugh did they hear on their journey—
To smile has become a lost art—
But they never drew near
To help drive 'way a tear,
Or to cheer up a dull aching heart.

Each soul that they met as they lingered,
Seemed damned to an eternal hell;
But the aim of our strife,
And our struggle in life,
Is always to break from our cell.

If we're judged by their rules of the battle,
Or tried by their rules of the game,
We will ne'er win the fight
By the power of our might,
Nor be counted with those who o'ercame.

But the Great Referee of the Contest,
Whose judgments ne'er come with a snap—
For He knows the whole game,
And He knows why we're lame—
He'll give us a big handicap.

—By the REV. CHARLES STELZLE.

General Labor Notes.

Typographical Union No. 27, Mobile, Ala., enjoys the distinction of being the oldest labor organization in Mobile. It was organized in 1836.

The United States Steel Trust has purchased 361 acres of land at Stinesville, Ind., and it is announced that the corporation will expend $11,500,000 in developing stone quarries and building a "model town" for its employes, similar to the one existing at Gary, Ind.

An increase from 50 to 60 cents an hour in the pay of linotype and monotype operators at the Government Printing Office at Washington, D. C., was recently put into effect.

The Federal High Court of Australia, in a suit brought by the employing brewers, has decided that the union label is not a trade mark, and has ordered that the registration of the Brewery Employes' label be canceled.

A lockout of 200,000 cotton operatives in Manchester, Eng., seems inevitable. The wage dispute is of long standing. The employers proposed to reduce wages 5 per cent., but they finally consented to postpone the reduction until January 1 of this year.

The subject of a state industrial college is being considered in Massachusetts. It is proposed to establish the institute in Boston and that it shall maintain both day and evening classes.

The International Piano and Organ Workers' Union has voted in favor of the proposed change in the constitution calling for international conventions but once in five years.

At Lethbridge, Canada, with a population of 4,000, there are about 1,000 members of trades unions.

The conditions of unemployment at Glasgow are worse than in most of the other British cities, there being 22,000 men seeking work at that place.

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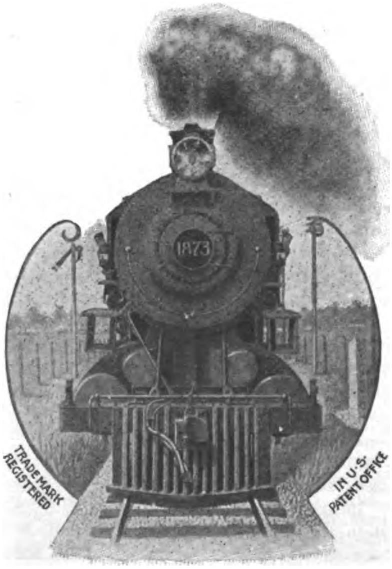

Contributed

Chicago Smoke Conference.

A most important event in the history of the lodges of Cook County, Illinois, was an open meeting held on Friday evening, December 18th last, at 145-7 Randolph street, Chicago, to discuss the smoke nuisance. This very important question has been under discussion for some time, much to the satisfaction of our members who run in and out of Chicago, as well as of switch engine crews working in our city. The hall was crowded, and the outpouring of the brothers proved that the question is a live one and one in which they are all deeply interested. All Cook County lodges were well represented, and railroad officials were there in force also. The city, too, was represented, and we had a goodly number of visitors from other States, amongst them being Brothers Ackerman, Beard and Boone. In addition to all the foregoing the entire Milwaukee board was there.

It was the first time in the history of our Order that a meeting of this kind ever took place. All felt proud to realize that the day had come when representatives of the human factors essential to railroad operation could thus meet and discuss a problem, in the solution of which they were mutually concerned, and all feel confident that good results will ensue.

The railroad officials heard from the brothers present all about black smoke and how it was made, and they in turn informed the brothers as to how in their opinion it could be avoided. On one point, however, all present were agreed, and that was that everything that could be done was being done to obviate it, and the officials expressed their appreciation of the efforts put forth in this direction by our brothers. The meeting was arranged for by Grand Master Hannahan and Vice-Grand Master Kelly, which accounts for the number of railroad officials present, and to these brothers the thanks of the Cook County lodges were tendered for what they had done in making the meeting such a success. The brothers of Cook County have been fighting the smoke law for some time, not with a view to its repeal, but to secure its modification at least to the extent that our men will not have to serve from five to fifteen days for the existence of a necessary evil for the creation of which they are not responsible.

All the railroad officials that were called upon responded very cheerfully, and from their words of praise and good fellowship it was clear that we have their friendship, and that they appreciate the efforts we are putting forth to abate the smoke nuisance. The brothers who were called upon also responded cheerfully and willingly, and presented the situation from the enginemen's view as clearly, interestingly and intelligently as the officials presented it from the standpoint of the men who direct the operation of our great systems. I would give the names of all present, as I feel they are each one entitled to special mention, but for my hesitancy to take up all the valuable space the publication of such a list would require.

We desire to thank all railroad officials that attended the meeting, and we hope to again have the pleasure of their company in the near future. We also wish to thank the gentlemen who represented the city government, and last but not least we want to call the attention of our brothers to the fact that the Cook County lodges hold a joint meeting on the third Friday evening of every month at 151 Randolph street, second floor, Chicago, Ill., and to state that all are cordially invited to attend same.

In closing I want to thank all who assisted in making the meeting a success, and desire to express the hope that every brother in our broad land may enjoy a bright and prosperous New Year.

GEORGE GODING.

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Union Label a Religious Emblem— A Preacher's Opinion of It.

The following appeared in a recent issue of the Commercial Appeal, of Memphis, Tenn., and as I deem it well worthy of reproduction, I submit it for publication in the columns of the Magazine.

That the union label is coming into that place in the public mind which it was intended by its creators and advocates that it should occupy is becoming more evident as time passes, and new converts are made to the truth it represents. The Women's Label League has only recently been launched in Memphis to take up the work already inaugurated in centers, and its success is assured. By far the strongest utterance on the subject of the union label is found in a sermon recently delivered by the Rev. Walter Vrooman, a prominent Baltimore divine, which goes far to justify the claims of the most ardent supporters of the label.

After a discussion of the labor question in all its various aspects, the reverend gentleman said:

"What can be more sacred, more holy or more deserving of the reverence of men or angels than the union label, which signifies that human life has been more highly valued in the production of commodities than the mere profits sought for by greed; the label is an emblem of justice, of fraternity, of humanity. When you find a label in a garment or on a box of cigars or on a loaf of bread you can be sure that neither was made in a sweat shop, that no children's fingers were compelled to sew or sort tobacco in the hours of the night intended for healthful childish sleep; when you see this label on any commodity you can buy it with a clear conscience, knowing that in doing so you are not becoming a partner to any institution that degrades humanity for private profit; you can sleep soundly also and not be worried with thought of typhus fever, smallpox and leprosy which are often scattered broadcast from Chinese opium joints, penitentiary convict cells and tenement sweat shops where the most degraded specimens of humanity put their life's blood into marketable goods whereby the unsuspecting public suffers all manner of foul and loathsome disease. The union label is a religious emblem; it is a religious act to buy goods to which this label is attached; an act blessed on earth and honored in heaven; while it is a sin to buy a cigar, a piece of clothing, a pair of shoes or a loaf of bread without this label, for then you do not know but what you are building up the business of some heartless tyrant who is extracting a fortune from the drudgery and degradation of his fellow citizens at the risk of the public health. God bless the union label, and I hope all of you as you leave this house tonight will carry indelibly impressed upon your minds the picture of the union label surrounded by angels, and that you will always know that the favorite banner in heaven is that banner which represents justice to labor, fresh air and sunshine and healthful conditions for those who toil and the truth that human life is of greater moment than the goal of gain."

L. O. GARRAWAY,
Member Lodge 204.

* * *

We Must Fight Vigorously and Unitedly for Our Own Legislation.

On account of Congress and the Legislatures of thirty-one states being now in session, the question of labor legislation should be paramount with us. When we stop to consider how the laws of our country affect our interests, and particularly the interests of railroad employes, we should exert every effort to inform ourselves as to such matters. It is a fact not any too well known that the laws of about thirty-five states actually discriminate against the employes of railroads. That in cases of personal injuries and death, passengers, persons injured at crossings, and even trespassers, have far more protection before the law than is given to us. That in some states our people can be imprisoned for purely accidental injuries inflicted upon other citizens in railway accidents.

Doctrine of Assumed Risk.

From a standpoint of justice it is not right that an injured railroad employe should not be allowed to recover damages because he knew of the defect causing his injury prior to the accident. This is the inhuman doctrine of assumed risk and is the law in almost every state except Texas, New York and Oklahoma. It was the law in Texas until our legislative board had it repealed in 1905. Only one case need be mentioned to show how unjust our law was until changed. A fireman on the T. & N. O. Railway and his engineer had reported a number of times a leaky and defective lubricator glass. With each report the warning was given that should it burst while they were facing the glass it might cause them to lose their eyes. It was not repaired and the unfortunate fireman suffered the loss of one eye and the impairment of the other. Upon the refusal of the railroad company to pay him anything for his injuries he brought suit for damages. The trial court allowed him $6,000, but the higher courts reversed and dismissed his case. The company proved that the fireman not only knew of the defective condition of the lubricator, but of the danger of continuing to work near it, as evidenced by his own reports. The law of Texas at that time placed the burden of responsibility on him and held that he had assumed the risk. Any employe knowing of a defect and of the danger to him of using or working near such defect was held in law to have assumed the risk should he be injured. That was the law in Texas until changed and is the law of nearly forty states today.

Fellow-Servant Law.

Another law, equally as harsh and unjust to railroad employes, is the one relating to fellow-servants. Should a fireman be injured by reason of the careless and negligent act of an engineer, conductor or some other trainman, he could not recover damages for personal injuries because it was the act of a fellow-servant and not of the master. This was the law in Texas until changed through the efforts of our legislative boards in 1897. But it is still the law in nearly forty states. I might also mention laws of many states that permit our wages to be made subject to seizure in garnishment proceedings, of laws holding us guilty of negligent homicide in crossing accidents and the like, and of many other unjust and discriminating laws, but enough has been stated to show how great are our legislative interests and to suggest that we should become active at once.

How to Get Good Laws.

Texas railroad employes point with pardonable pride to the laws abrogating both the doctrines of assumed risk and fellow-servant, to the law exempting their wages from garnishment and to many safety appliance enactments, and are often asked by their brothers of other states, "How did they get them?" Such questions may be answered by telling of the unity of action on the part of all laboring people in the state; by the intelligent manner in which they inform themselves upon the labor records of all candidates before voting for any; by their giving the Joint Labor Legislative Board, representing them at Austin, positive and iron-clad instructions to work only for the measures endorsed by their joint convention, and to leave the question of prohibition, the Bailey issue, railroad consolidation and rate bills to be settled by the interested parties. In short, the Joint Board is told to attend to its own business and let other interests do likewise. As a result of following this policy every law asked for by the laboring people of the last legislature was enacted. It has caused us to secure the passage of 28 laws in the past three sessions of our State Legislature, and to defeat every bill that would in any way injure us.

Only once during the last session were we in any danger of defeat. That was when some railroad employes opened headquarters at a leading hotel and began an active campaign assisting the railroad companies in some of their contests. These employes went to the extreme of actually threatening some of our best friends, members of the Legislature who had introduced and were then fighting for the passage of our bills. But they were soon discredited by their own conduct and by the membership. At the Dallas meeting of the B. L. E. of the southwest in April, 1907, their conduct at Austin was severely condemned. Also at the joint meeting of the legislative boards at Fort Worth in 1908, they were censured. The by-laws of the B. L. E. legislative board, adopted at the latter meeting, prohibits their members from lobbying for any corporation without the consent of the chairman and secretary.

A movement is on foot to have railroad labor organizations join forces with railroad companies for the purpose of securing legislation desired by the latter. A fair test of the sincerity of the advocates of such co-operation in fostering "railroad" legislation is being witnessed in Texas today. Judge N. A. Stedman, who is the general attorney of all railroads in Texas at Austin, is now actively engaged in a campaign to repeal our fellow-servant and assumed risk laws. The newspapers, commercial secretaries, organizations and other channels are being used for the purpose. He claims that $1,800,000 was paid out by the railroads for the year ending June 30, 1908, on personal injury claims. As four-fifths of that amount, if his figures are correct, was paid to injured railroad employes, it would seem that we should be interested. The judge, however, does not tell the public, whom he is trying to arouse, that the railroads for that period of time injured 5,532 persons, or 1,240 more than during the preceding year. And that the number killed was 250. If he had stated this it might have explained matters. He adroitly aims all of his criticisms at the "personal injury laws." But he does not deceive us, because it is only under the provisions of the assumed risk and fellow-servant laws that an injured railroad employe can recover damages. It should be remembered that it is the same Judge Stedman who visits our legislative board meetings and who makes such stirring speeches to us in behalf of co-operation. He came to our Fort Worth convention as the "ambassador of peace and co-operation" between employers and employes.

It remains to be said in conclusion that if we are to retain the laws that we have secured for our protection, and are to secure the passage of others, we must make no "entangling alliances" and be ever on the watch.

JOSEPH S. MYERS,
Chairman Texas Legislative Board, B. of L. F. and E.

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Trade Union Success in Germany.

The General Federation of German Trade Unions has just published statistics concerning strikes, lockouts and trade movements during the year 1907, and I suppose that these figures will be of interest to our American fellow-trade unionists.

The number of trade disputes causing stoppages of work was 2,986, involving 281,030 workpeople. Compared with the two preceding years, there was in 1907 a decrease in the number of strikes and lockouts as well as in the number of workpeople affected. Of all strikes and lockouts reported in 1907, thirteen hundred and forty-eight ended in favor of workpeople, 737 were compromised and 666 ended in favor of employers; the result of 185 disputes remained unknown.

In 5,067 cases trade movements involving 525,235 workpeople ended without stoppage of work. In consequence of the labor disputes and trade movements 248,911 persons had their working time shortened and 513,213 persons obtained increased wages. The following table shows by groups of trades the number of persons participating in the reductions of hours and the increase of payment, and also average gain per person:

GROUP OF TRADES	Number of persons obtaining reductions of working hours.	Average weekly reduction per person.
Building trades	50,792	4 hours.
Metal trades	92,144	3¼ "
Printing trades	3,025	2 "
Woodworking trades	25,516	2¼ "
Food trades	14,448	5¾ "
Clothing, leather and textile trades	36,156	3 "
Commerce and transportation	10,173	5¾ "
Other trades	16,657	6¾ "
All trades	248,911	3¾ hours.

GROUP OF TRADES.	Number of persons participating in increases of wages.	Average weekly increase per person.
Building trades	151,843	2.40 marks.*
Metal trades	97,585	1.61 "
Printing trades	3,456	1.48 "
Woodworking trades	51,040	1.57 "
Food trades	43,538	1.95 "
Clothing, leather and textile trades	70,694	1.47 "
Commerce and transportation	36,055	2.55 "
Other trades	59,002	1.77 "
All trades	513,213	2.07 marks.

* 1 mark is worth 23 cents.

Of all persons benefited, 59,309 had their working time shortened and 136,995 had their wages increased as the immediate result of strikes. The shortening of the working time and the increases of wages obtained without stoppages of work were more considerable than those obtained by means of strikes, but this does not indicate that peaceful relations are beginning to prevail between workers and employers. Those who are acquainted with the conditions in this country know that any improvements got without stoppages of work were preceded by hard struggles, and that the employers grant the demands of the workers afterwards so as to prevent a new strike from breaking out which, even if they were victorious, would cost them more than granting the demands of the workers. That the employers in Germany are by no means inclined to show themselves more friendly towards the workers is demonstrated by the fact that in 1907 104,738 workpeople were locked out, as compared with 93,356 in 1907. H. FEHLINGER.

Munich, September, 1908.

Organization of Illinois State Legislative Board.

The Illinois State Legislative Board was organized in the "capital of the world" (Chicago) on December 18, 1908. Grand Master Hannahan presided and Third Vice Grand Master A. P. Kelly acted as secretary. The chairman, Brother Hannahan, explained the object of the call and after he had spoken at some length, dwelt on the benefits to be derived from the formation of such a board and cited the great work that has been accomplished for our members by legislative boards in other States, and declared that there was no good reason why similar results could not be achieved for our membership by a well organized and efficiently conducted legislative board representing our members in the great State of Illinois.

Brother Kelly followed Brother Hannahan in an address which was full of words of encouragement and practical ideas, and which, like Brother Hannahan's interesting talk, was thoroughly appreciated by all in attendance. There was an excellent representation present from all over the State and every man seemed ready and willing to take up the burden and do his share in promoting the success of the board. There were also present brothers from other states who came to give us the benefit of their experience in legislative board work, amongst them being Brother Ackerman, of Ohio, chairman of the Legislative Board of that State, and Brother McQuaid, general chairman of the Rock Island system. The visiting brothers gave us valuable assistance, and we desire through the columns of the Magazine to thank them for it.

After the meeting was opened a committee was appointed to draft by-laws for the government of the Board. The committee consisted of Bros. N. C. Allen, Lodge 477; B. B. Bennett, Lodge 44; George Goding, Lodge 490; L. E. Barrett, Lodge 417, and R. Bradley, Lodge 48. The committee reported during the afternoon session, submitting a draft of the by-laws which was adopted and ordered to be printed and a copy sent to each lodge in Illinois, so all would become familiar with the laws governing the State Legislative Board.

As already stated, the meeting was largely attended and we expect that some effective work will be done this winter. In carrying out its work the Board will need the assistance of all members in the State, and for this we feel that we will not appeal in vain. We are confident that the rank and file will do everything possible to help the Board in its efforts, and in turn we promise that nothing will be left undone to accomplish good results for the benefit of our members.

GEORGE GODING, Secretary.

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Boycotting Stopped by Organized Labor.

In reading the November issue of the Brotherhood of Locomotive Firemen and Enginemen's Magazine I noticed that Miss Agnes Nestor, secretary and treasurer of the Glove Workers Union, delivered a very interesting address to our representatives at the great Columbus, Ohio, Convention, which through our worthy Editor and Manager of the Magazine has been placed in the hands of the members who were not permitted to attend the Biennial Convention.

Miss Nestor gave cards to our various representatives which bear the names of glove manufacturers that are using the union label, and how easily one may use gloves which he thinks are union made that are not, and do not bear the label.

I am glad that Brother McNamee has, as is his duty to our noble organization, published same in our most highly esteemed Magazine. If the same rule would be applied to other garments and the necessaries of life, such as overclothes, clothing, shoes, shirts, hose, underwear, hats, and in fact all classes of goods that are necessary for wear and uses in all vocations of life, it would not be necessary for labor unions to publish the names of such manufacturers as being unfair to them, as was the case with the Buck Stove and Range Company and a few others that have come to my notice. Calling attention to each respective company employing union labor, as did those cards which Miss Nestor distributed at the Convention, simply shows who are and who are not fair to organized labor, and leaves the rest to be considered by the members of the various organizations, who may judge for themselves which is best for them to purchase, goods made in a strictly sanitary and healthful shop, or those which are made behind the dark, damp prison walls by convict labor and in other places which employ cheap labor and material.

I believe this alone would tend to increase the standing of organized labor, from the fact that those who employ union labor would gain more customers, while those who do not employ union labor would find poor sales for their output, and would find that the only way for them to progress would be to employ organized labor and be on an equal footing with others.

Should any of the manufacturing companies discontinue employing organized labor that fact could be made known by publishing a notice of their discontinuance in the magazines and journals of the various organizations. Thus all the members could see at a glance that they no longer employed union labor or attached the label to their product. Any person who is a close observer may readily see the difference between clothing made under fair conditions that bears the label and that made by sweat shops or others that does not bear the label. Such clothing is not up to the standard, neither does it wear or fit with the same degree of perfection.

It is the duty of each and every union man or woman to purchase, and insist on merchants having for sale, all goods they may need bearing the union label, and should not be made believe that others are just as good.

I would very much like to see published in an early issue of the Magazine the names of the manufacturers which employ union labor and attach their label to their products, such as overalls, shirts, dress suits, shoes, hats, caps, hose, underwear, etc., etc. They need not all be published at one time, but as has been the case with the Glove Workers' Union, as the old adage is, "In Union there is strength." The one great object in view is, as Miss Nestor has said, "we expect you to assist us by buying our goods," or words to that effect. We should be allied more closely, and as members of one organization should strive for the same thing that members of other organizations are doing—the sanitary condition of our working compartments and shorter working hours, with living wages.

Brothers, remember the resolutions which were adopted at the closing of Miss Nestor's remarks and practice same, lest you feel guilty of a broken vow. Just imagine the vast multitude of people who hold membership in some organization or other, and what it would all mean to the manufacturers should these members all purchase only what material his or her brother or sister helped to make and attach the union label to. I am sure that it would leave some manufacturer feel the worse for wear. Not that I have any prejudice against any manufacturers, but one firm in particular I have in view, namely, Sweet-Orr & Co., have done much to encourage buyers of union-made clothing and in endorsing the use of the union label. All other manufacturers should do so with equally good results. I am satisfied that this company has increased the sale of its goods in this way, and I believe they will tell you the same. True enough you may buy some goods a little cheaper than similar goods bearing the union label, but you in return get just what you buy—cheap material made by cheap labor.

This I consider, in one sense of the word, to be a very serious matter as connected with the future welfare of organized labor. Never in the history of the country, or of the world, did we hear so much about union labor interests as we did in the past year. Unions are gaining steadfastly, and each member should show his and her influence in gaining new members. There are, no doubt, hundreds of men and women who are eligible to join their various labor interests. Possibly there are many who would join if some member was to ask them to and explain to them their necessity and usefulness to the labor world.

Whenever I meet a fireman my first thought is to ascertain if he is a member of our organization, and if he is not I then ask him why not. There is no excuse for one who is eligible and who does not become a member. If funds are lacking cut your cigar bill in two and see what a saving you may possibly possess at the end of a month. This same plan may also be followed with many other luxuries of life which can be avoided. This is a subject on which I would like to hear from some of the other members and readers of this Magazine in the future.

HARLEY ARNOLD.

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The Garnishee Graft.

The most satisfactory law that was ever made for grafters that prey on railroad employes is the Garnishee Law. It is a law that has ruined many a happy home. It has been the cause of many good, honest men being thrown out of employment.

It matters not how good a job a man may have, or has had, he is likely to get into straightened circumstances sometime, and if he is unfortunate enough to owe a person any small or large bill and cannot pay it, the first thing the creditor thinks about is the mighty Garnishee Law, not caring whether his creditor ever does another day's work or not, just so he (the creditor) can get to discomfort the party indebted to him.

It has worked more injustice than it has ever worked justice. The great railroad corporations of this country will not tolerate employes being garnisheed. but it seems to do some of the grafters good to garnishee some poor unfortunate and make him a lot of unnecessary expense and perhaps cause him to lose his position.

On the line upon which I am employed the officers will not stand for their employes being garnisheed and will discharge them as soon as a garnishment is put in against them.

I think such a law as the Garnishee Law should be annulled forever. We may perhaps have some genuine "dead beats" employed on railroads who would make a practice of using their credit because they could not be garnisheed, if such were the case. It would do good one way but injury in another way—that is, for some men who go on a new job without any means of support.

I would like to get the opinion of some of the brothers on this question, and I for one am in for seeing if there could not be some way of doing away with this Garnishee Law all over the United States, or having it declared unconstitutional.

MEMBER, Lodge 6.

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Miscellany

Great Prevalence of Postoffice Robberies—How Stolen Stamps Are Marketed.

Several weeks ago burglars robbed the postoffice at South Bend, Indiana, of $18,000 in postage stamps, and so successfully covered their tracks that no clew has as yet been discovered as to their identity.

That postoffices offer a tempting field for burglars is evident from the fact that 1,802 such robberies were committed during the fiscal year ending June 30, 1907, or an increase of 221 over the preceding year.

From these robberies the U. S. government has been a heavy loser, for under postoffice regulations the postmaster must be guilty of carelessness or negligence before being required to stand a loss by robbery himself.

This rule will, however, only partially relieve the South Bend postmaster, for under the act of Congress providing to reimburse postmasters for loss by burglary, not to exceed $10,000 can be paid in any one case, so that unless reimbursed by a special act of Congress this particular postmaster will lose $8,000.

Losses occasioned by the robberies of postage stamps which the government assumed during the fiscal year ending June 30, 1907, amounted to $72,984.81, losses of postal funds from the same cause were $15,624.71, and money order funds $12,711.92, a total of $101,321.44.

The number of postoffice burglars arrested during that year were 372, a large proportion of them being convicted.

Has Become a Tempting Field for "Experts."—Many of these robbers are common yeggmen—a species of crude burglar who in recent years has become exceedingly numerous.

These yeggmen are for the most part criminals of a cheap type, thugs and hobos, with whom a cold-chisel, some nitroglycerine, a bar of soap and a supply of percussion caps constitute an outfit. Often they equip themselves for their crimes by robbing a blacksmith shop, and usually station an accomplice outside the building in which they operate to give them warning in case of danger. But like the professional burglar, they are always armed to the teeth and ready to take life rather than lose their own liberty. It is, however, stated on good authority that the stamp stealing industry has for some time been attracting experts in the burglary "profession," and that amongst those now making a specialty of it are some of the sharpest and shrewdest of that class of criminals.

The South Bend Robbery.—It would certainly appear as though the burglars who robbed the South Bend postoffice were "professionals." At least such a conclusion is justifiable from the way in which the robbery was planned and executed, as well as from the precautions taken to prevent discovery.

They gained access to the vault by drilling a fourteen-inch hole through a fire-proof wall which formed one side of same. A boy or a small man entered the vault through this hole and passed the plunder out to his companions. Two of the postoffice clerks worked within one hundred feet of the vault, but had no knowledge of what was taking place.

The job shows that it was well planned beforehand, and that the robbers waited for the opportune time before commencing operations.

It was the work of past masters, not a clew being left that would assist in locating them. The sound of their operations was deadened by the use of woolen blankets, which enabled the robbers to work with greater speed. As the booty would fill six or eight suit cases, the authorities say that at least three or four men were employed in the robbery.

How Stolen Stamps Are Disposed Of.

Stamps are a line of goods that are unusually tempting to the burglar. They look alike; there is no way to tell where they come from, and they are current everywhere in the country whose government issues them.

Developments thus far have established the fact that stolen stamps are usually taken to a "fence" in some neighboring city, where they are purchased at a discount.

That the people who operate the "fence" have a regular market for the stolen stamps is evident from the statements of government detectives, who say that it is surprising how few questions are asked and what little explanation as to how the seller came by them it takes to satisfy business men of high standing who buy postage stamps at a big discount from the government rate.

In Chicago police circles the belief prevails that what is termed a regular stamp "plunderbund" has long been established in that city, and it is openly asserted that in some instances the purchase of stolen stamps has been traced to large mail order houses—institutions some of which spend in the course of a year from seventy-five thousand to one hundred and twenty thousand dollars in postage. It is claimed that the stamps are sold on a basis of 75 cents on the dollar, so that in a purchase of $20,000 worth from the "plunderbund" the substantial saving of $5,000 is realized.

The stamps taken in the South Bend robbery will, no doubt, be disposed of at some such "fence" or "plunderbund" in Chicago, thus giving the detectives of that city another interesting case to work on.

Little Chance of Ultimate Escape.—While these robbers may have been successful in escaping and covering up their identity, their freedom is but temporary, as the government detectives will persist in their efforts to run them down even though the pursuit must cover years. It is more than probable that a false sense of security born of their success in evading the officers for the time being will embolden them to repeat their crime and thus hasten their capture.

How to Prevent Stamp Robberies.

Regardless of the fate of the individual thief, however, the fact remains that stamps are being stolen right along, and will continue to be stolen unless the government adopts some practical method of prevention.

To equip each of the thousands of postoffices throughout the country with burglar proof vaults would cost millions of dollars, and even this might not in every case prove an effective safeguard, as the difficulty of constructing a really burglar proof safe or vault is generally recognized. In fact, authorities on the subject hold that it is hardly possible to do so.

To obviate this evil one of two plans which have been proposed would, we believe, accomplish the desired result. The first is embodied in a recommendation by the chief inspector of the Postoffice

Department, who suggested in his last annual report that if all the one and two-cent stamps furnished to presidential offices (which include the first, second and third classes) had overprinted on them the name of the postoffice to which they were issued they could not be disposed of by burglars so readily, and possession of them would help to convict a thief or dishonest purchaser, as a consequence of which they would not be sought by safe blowers, and if taken by them would be either concealed or destroyed. One thing certain is that they could not be used in large quantities for postage, and if discovered could readily be identified and claimed as stolen government property.

The second plan, and probably the better of the two, as it would obviate the necessity for defacement by overprinting, is as follows:

> "Let the stamps issued be printed according to congressional districts of the United States. Let the stamps sold, for instance, in Indianapolis bear upon them 'I 7,' which would mean Indiana, Seventh congressional district. Suppose the Indianapolis postoffice were robbed and the thieves should take their stamps to Chicago for sale. Who would buy them? Not the stamp 'plunderbund,' for if an effort were made to use them in Chicago the postoffice authorities would ask: 'Where did you get them?' If stamps were stolen from any district and an effort made to use them in another, detection would be almost immediate."

About the only objection that can be raised to this second plan is the "mechanical printing difficulties that might be encountered in the various stamp 'runs' of the government printing offices." Whatever additional expense this would occasion, however, would be indeed slight when compared with losses that will be sustained from the certain continuance of stamp robberies or the enormous expense to which the government would be subjected in furnishing every postoffice with adequate protection facilities, such as burglar proof safes, etc.

That the government will be forced to take some such steps is evident from the extent to which postoffice robberies are increasing in the face of the fact that as a result of the establishment of rural free delivery the number of postoffices in the country has been steadily decreasing. As stated elsewhere in this article, during the fiscal year ending June 30, 1907, there was an increase of 221 over the number of these crimes committed during the preceding year, although the number of postoffices had decreased from 76,688 in 1900 to 65,600 in 1907, from which it is evident that stamp stealing and dishonest dealing in stolen stamps has become somewhat of an organized business.

As to the Respectable Criminals.—But what of the business men who purchase these stamps—and, as already stated, it is said that some of them are prominently identified with large department stores. Ah! they are respectable citizens. They simply *purchased* the stamps and no doubt hold that they are not responsible for the methods constituting the source of supply. Yet, as a matter of fact, they are just as guilty of wrongdoing as are the men who committed the original robberies. The act of purchasing the stolen stamps they may reconcile to their consciences—if they have any—on the ground that the nation—the people at large are the sufferers, and that no one individual is subjected to hardship as a result of their dishonesty.

Their crimes differ only in degree from those of thousands of other "gentlemen" of high social standing who, operating under the veil of respectability, conspire together in violation of law to compel the common people to pay exorbitant rates for the necessities of life, and thus bring deprivation and misery into thousands of homes throughout the land.

The ends of justice will never be attained until the burglar and highwayman operating with the "jimmy" and mask, and the brass knucks, black jack and revolver are found side by side on a common level, dining from the same prison table with the social lights who, bedecked in diamonds and attired in broadcloth, rob the people through the medium of the highly tariff-protected, law-breaking and law-defying trusts and monopolies, and make it impossible for the poor man's meager earnings to supply his family with the comforts and in thousands of cases with the necessities of life.

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Where It Falls Down.

Little Willie—Say, pa, does philosophy help us to endure trials?

Pa—It helps us to endure the trials of other people, my son, but it usually falls down when applied to our own.—Exchange.

Getting at the Roots of Crime.

The great philanthropic movement of which Charities and The Commons is the official publication, is arranging for a meeting of the International Prison Congress which will assemble in Washington in 1910. The chief purpose of this congress is "to get at the real sources of crime and stop them." Identified with this movement are to be found some of the greatest men and women in the United States, many of them of large means—men and women who are great in heart, soul and mind, and whose chief object in life seems to be to do good for the love of doing good.

The following is an announcement of the coming meeting of the International Prison Congress authorized by Charities and The Commons:

"It is useless to stay the flood of crime by dikes at the mouth of the stream; it must be filtered at its source. Intelligent penology, like intelligent forestry, does not consist merely in cutting down crooked trees; it means work in the nursery, the protection of the growing plants." This is the idea of the new penology as expressed by one of its strongest advocates, Samuel J. Barrows, Corresponding Secretary of the Prison Association of New York.

This "new idea" of modern philanthropy, this getting at the real roots of the trouble, will be carried out in the coming meeting of the International Prison Congress which convenes in Washington in 1910. Secretary Root, who is, in one sense of the word, an international promoter, has asked Congress for $50,000 to show the European delegates what this country has accomplished in improved methods of dealing with crime, especially in the direction of juvenile courts, probation, child saving, and other reformatory agencies.

The International Prison Congress is one of the most important deliberative bodies in the world. It was organized in 1871, and, since its first meeting in London in that year, other congresses have met in Stockholm, Rome, St. Petersburg, Paris, Brussels, and Budapest. They have studied criminal law and environment, heredity, alcoholism, administration of courts, treatment of offenders, criminal labor, international comity and international law.

It is to be hoped that Congress will have the same broad viewpoint of Secretary Root and grant an appropriation that will make the 1910 meeting of the International Prison Congress in this country a success.

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A Wrong Act Is Hard to Bridge Over.

A wrong act is hard to bridge over,
  And no matter how hard you may try,
It seems to grow wider and wider,
  Like the space 'twixt the earth and the sky.

At first, it will seem to work smoothly,
  But alas, the great gap is still there!
And it needs something more than repentance—
  Kind words, or a deep, heartfelt prayer.

It requires a foundation sincerely
  Built up on a basis of love
That is spotless and pure as the lilies
  And as fixed as the planets above.

A wrong act is hard to bridge over,
  And no matter how hard you may try,
You will have to commence at the starting
  And labor with many a sigh.

For meddling with sin brings us sorrow,
  Whoever the sinner may be,
And perhaps he will struggle forever,
  And die, and yet *never* be free!

—ADELBERT CLARK.

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Fashion's Follies.

Harry G. Holden, in July "Physical Culture," says:

It has always been fashionable to be a fool.

The height of fashion and the height of folly go hand in hand.

Nearly all fashionableness is extremely foolish, and nearly all foolishness is extremely fashionable.

In the most elite society, conventionality is an ever-acceptable substitute for character, wealth for worth, broadcloth for brains, jewels for judgment, style for sense, riches for righteousness, money for manhood, vanity for virtue, position for purity, decoration for decency, paint for piety, treasure for truth, conceit for conviction, silk for sincerity, gout for goodness, gold for godliness, culture for Christianity, polish for purpose, manners for morals.

In the dictionary and in high society, satin and Satan are not far apart.

Fashion is largely responsible for the senseless arguments heard for ages in favor of saloons, ... and other similar abominations.

Fashion makes a white shirt more important than a white life.

Fashion prohibits a man from appearing in public without a coat, but permits him to appear anywhere without a character.

Fashion is one of the principal promoters of depravity, one of the worst enemies of progress.

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THE NEW CANADIAN LAND ACT

By Herbert Vanderhoof, Author of "Stories of the Trail," "The Hillmen," etc.

Twenty-eight million acres of Canadian land were thrown open to settlement September 1, 1908, the day on which the Oliver land act went into effect. This domain, exceeding many a historic principality, emerged quite without the notice an event so important would have attracted anywhere else. But that emergence had a very broad meaning, far beyond the stir and excitement usual in land openings, and of the deepest import to futurity.

Under the Oliver land act the "last west" passed out, and the New Canada entered to take her place among the countries of settled conditions. The Indian, the hunter, the logger, and the cowman had each in turn enjoyed a long day of possession. Now the farmer has come in, the latest and final occupant, and is turning the land from grass to grain at a rate that recalls the earlier days in the western states of the Union, but with better methods, and without the old hardships. The first of September brought the beginning of this last great change.

The newly-opened lands are the odd-numbered sections held by the Canadian government after the railways had selected their land-grants. The railway lands had been filling up while these sections were withheld, so that the settlers now to come will have what the American settlers had to wait for—neighbors in plenty, towns nearby, and complete, well-ordered railway service. Settlement here has none of the trials and weary waiting that the old frontiersman and pioneer had to endure. There is no "frontier" in Canada any more—all the pioneering has been done. The wilderness has been subjugated, and population is spreading out over the Canadian plains at a rate that in a few years will have covered them all. Here will be the most extensive farm land ever known—the mightiest wheatfield in the world.

The story of western Canada is the story of the native days, the cattle days and the days of the wheat. For almost two hundred years it was a big lone land with rivers of heroic size pouring through almost incomprehensible reaches of prairie and forest, finally losing themselves in the great lakes and bays of the north—with only Indians and wild beasts to emphasize the loneliness of it, save where, here and there, the posts of the fur traders dotted the endless stretches, or through the brooding woods on noiseless feet went hunter and trapper.

But the Hudson's Bay Company, for all its fascinating history, was not the element needed to push the fortunes of a big lone land. In the nature of things, the fur traders were not anxious to call attention to their territory. They never sang the praises of the land they lived in. They never invited anybody to "come and see."

The lumbermen, to be sure, found their way up here without much loss of time, but it is a far cry from a lumberman's camp to a white house with green blinds, and red geraniums on the front lawn. The cattlemen followed as soon as somebody discovered the surprising amount of nutrition in the prairie grass and carelessly mentioned it, and cattle and horses roamed almost at will across the level lands. But cattle herding, like fur trading and lumbering, does not make for homes.

So all the romance of the fur trade and

the heroic tales of the loggers and the picturesque figure of the cowboy belong not in the story proper, but in the preface. It was through none of these, though now they have their place of course in her development, but through the farmers, that western Canada came to her own.

Because the black loam of her prairie is a storehouse of the particular baby-food the tiny wheat plant thrives on, and because the air above is soaked with sunshine in which the stripling stalk grows and grows and matures and heads out into forty-bushel wheat, and because the men who love to labor with the soil and love the chances that a new land gives are coming here—a steady stream of them—and because the railroads have not feared, sometimes to precede, sometimes to follow the settlers—that Canada has come out of the dim dreamland of song and romance, and awakened to the fact that she is of a satisfying importance and very much to be taken into account.

When the Dominion of Canada was first confederated, the new government followed the example of the United States in surveying and offering for homesteading the vast public lands of the west. The odd-numbered sections were reserved for grants to the railways and the even-numbered sections were offered for free homesteading. In the thirty or more years that have passed since that day, thousands of miles of railroads have been built on the prairies, bringing after them hundreds of thousands of settlers. The available free lands near the shipping points were practically filled, and during the last few years homesteaders have been forced in many cases to go miles from a railway. On September 1st all this was changed. The Oliver land act released the government holdings to private entry.

The effect of such an opportunity on the farmers of the western states must be unsettling. They have been migrating northward across the line in numbers which are astonishing to the uninformed—50,000 in the year 1907—and this new opportunity will tempt increasing numbers to try their fortunes in the farmer's land of promise.

Mr. Kipling calls one part of his beloved empire "The land of the waiting springtime." That might have applied to Canada eighteen months ago—as well as to most of the countries that count a spring among their assets. In the United States farmers were too busy hoping it would thaw by July to give much thought to Canada other than to decide that it had got a setback from which it would take time to recover. The facts proved to be otherwise.

The spring of 1907 seemed the sort of season when one would rather bear the ills he had than fly to others that he knew not of. But the usual number—nay more—flew to Canada; and found as a fitting reward for their courage that in general the unknown ills remained unknown. They saw their new home under the worst conditions possible, and found it good. Another year has shown them what the country is really capable of doing—for this is a "fat" year.

The statistics of immigration for the year 1906 showed a gain of 500 per cent. over the year 1896. In one month, April, of 1907, the increase over the same month in the previous year was 70 per cent. In 1906 Great Britain alone sent more than 98,000 people; and in the calendar year 1907—the year of unpleasantness—160,000, which was in excess of the immigration from all sources for 1905. The fiscal year ending June 30, 1908, brought more than 260,000 immigrants to Canada. Of these almost 60,000 were from the United States.

One thing of paramount significance is that all but a negligible fraction of these numbers went at once to the prairies. Those from the United States, almost without exception, were prosperous farmers before they came. Of the others, very few indeed stopped in the cities of the eastern Dominion. Many had been city dwellers, but practically all came over to take up land or to go into employment on the land. Herein there is a broad difference between Canadian and United States immigration.

Of the millions of people who come in at United States ports almost all stay in the big cities, where they add just so much to the problem of the overcrowded tenement districts—a problem that with this new element being constantly added seems well-nigh impossible of solution. Canada wants no additions of that kind. The immgrants are selected abroad, and when they reach this side they are not left to drift.

The Canadian immigration department takes the homesick stranger by the hand and coaxes him gently but firmly toward the big outdoors, where he soon finds that there is a place for him and the chance of a new home—a real home, not a few rooms in a tenement building—and where he and the country grow better for his being there.

The immigration system, admittedly the best ever organized, is administered by W. D. Scott, Superintendent of Immigration, at Ottawa, and W. J. White, Superintendent of Agencies. Mr. Scott familiarized himself with immigration management during the years when he was in charge of that department of the Canadian Pacific work. Mr. White graduated into his present position from newspaper work, and has the advantage of a wide acquaintanceship with leading editors all over North America. Under Mr. Scott's direction, the influx of settlers is handled with celerity, and with complete comfort to all.

Over 80 per cent. of the settlers are from England and the States, but the remainder, coming from northern, central and eastern Europe, are of divers customs and speak divers tongues. The directions and notices on the walls of the immigration halls are in nine languages.

These foreigners are taken in hand at their port of entry, and carefully looked after, separately or in parties, until they have reached their several destinations. With the farmer from the States the course is different. By dropping a post-card he gets into communication with one of the numerous and well-equipped agencies managed under Mr. White's direction, and is at once helped with all the information he wants, and finds his way made smooth.

The work extends to England, where a liberal plan of advertising is followed. Samples of Canadian grain and fruit and honey are sent there, and the shires are toured by agents in motor cars, who tell the country-folk the truth about the new country. The people brought over by these means are looked after much the same as the farmer from the States, and every care is taken to see them well situated.

At the immigration halls (as they are called) in all the important centers, the strangers are housed for a week, or even longer if necessary. At the Winnipeg Hall, for instance, there are ample cooking facilities, and beds for a thousand people—and everything is kept utterly, wholesomely clean. Those in charge of these halls know what the immigrants want, and how they feel. Their work is done with a thorough and sympathetic understanding particularly grateful to the foreigner.

Another element that is having much (and is going to have more) to do with the American descent on Canadian farm lands, is the new interest that is being given to farming. With the agricultural extension work that is being so widely carried on, with some of the best thinkers of the day devoting their faculties to the study of soils and seeds and the perfecting of methods, with the successful efforts the universities are making to get students into their agricultural departments, the number of young men who choose the city life is diminishing. There has been for some time a small but steady movement back from the city—a reaction from the wearying rush of the crowded places. This movement will be stronger and swifter because of the new vitality that is being put into the science of agriculture. It is a natural movement, too—the movement back to the land. Nothing could speak louder of artificiality than the crowded and crowding layers of humanity that make up so many districts of the great towns. What a way it is to live! No bit of the "first mother" for your own; no portion of the bending sky, unobscured by heavy veils of intervening smoke; no pure sweet healing air to take into your lungs. The giving up of three of the best things in this old world.

But in the United States good farm lands are not within the reach of every youth who decides to cast in his lot with the soil. What he must look for is land that is worth his work and sacrifice, worth his putting his heart and his hopes into, and yet that is sold at a price that he can pay. Where is he to look for that? Where else will he find such opportunities as those that smile at him across the forty-ninth parallel? The average number of persons to a square mile in the United States is twenty-two. In Canada the average is three to two square miles.

The wise young man studies the situation. He gets the personal experiences of settlers and hears story after story of those who sold good farms in the States for $60 and $70 and $100 an acre and invested in Canadian land at an average of $12 or $15, where after taking possession the taxes are only about $15 a year.

Other stories he will hear of those who went in with little or nothing and found that worry took wings after the second or third wheat crop. He will also learn that scientific farming is encouraged and that the government maintains experimental agricultural schools. Then when he discovers that Edmonton's superior degrees of latitude as regards New York are outnumbered by the degrees of comfort in her favor, he probably makes up his mind to pack his kit and trek.

The misconceptions as to Canada's climate formed a very positive element in the long delay in her development, and to this day it is the subject of a most surprising ignorance. Who, for instance, not having been here, credits the statement that there are no sleighs in Medicine Hat, or reads without a smile of that city's plans for supplying all the West with roses? Who believes that the winds blow warm in November and the sun shines from blue skies at Christmas, and the spring comes with soft airs and the flash of bird wings and the smile of blossoms in Medicine Hat, the maligned? When we learn enough of these things we will cease to think that the climate begins to deteriorate just north of the place wherein we happen to live. In Western Canada it is the Chinook wind that comes through the gaps in the mountains and sets our ancient theories at naught.

On something over six million acres that were prairie a little time ago, now the black of the furrowed field gives place in its season to the bravery of pale green, and that in turn to the clean gold of the headed wheat. And there are 170,000,000 other acres of Canadian prairie that are just as capable of bringing forth grain.

It is a pleasant thing to contemplate, all that reserve of food-producing land. It gives one the feeling that provision has been made for the future of the people of the earth.

In 1907, the year of the hard winter and the spring that never came and an August insolently out of character, Saskatchewan's black loam yielded an average of 15.17 bushels to the acre, an average which equalled that of the best grain states in the favorable seasons of 1905 and 1906. This year the crops are very heavy again. The total yield of wheat is about 110,000,000 bushels, of which at least 90,000,000 will be available for export.

Harvests without transportation go to waste. The intending settler, if he be discreet, will inquire into the attitude and enterprise of the railways on which he will have to depend to get his grain to market. The forces behind the railway companies, and the government itself, are fully alive to the supreme necessity of railway extension, to keep pace with the growth of the country, and to move the crops. The Dominion parliament at the last session authorized a government guaranty on $11,000,000 of railway bonds and the payment of $5,000,000 in cash subsidies, to the Canadian Northern. These bonds and this money mean 1,200 miles of new Canadian Northern track in the two years of 1908 and 1909. Part of this is a 175-mile extension of the Edmonton, Yukon and Pacific, the Canadian Northern line from Edmonton to the coast. The guaranty and subsidy will also enable the company to carry its new extension up to the Brasseau river, and open the great coal-fields there. This same company, the Canadian Northern, has already completed its short-line connection to Duluth, giving Canadian wheat another outlet on the great lakes; built a new line from Winnipeg to Regina, through the heart of the old established wheat country; and begun work on the line to the Pass, the first link in the road to Hudson Bay. The Canadian Pacific has built a line up through the Last Mountain Valley into Saskatoon, and is rapidly pushing west toward Edmonton and the mountains, evidently bound to have a second transcontinental main line.

The Canadian Pacific, during 1907, completed 570 miles and had under construction 878 more; the Canadian Northern had 275 miles completed and 355 under construction; the new transcontinental, the Grand Trunk Pacific, could count 565 miles added to its completed work and 1,579 in course of construction, while during 1908 the surveying, grading and track-laying has been pushed on by all three companies. The new railway, the Grand Trunk Pacific, for example, is running trains from Winnipeg to the Battle River, 670 miles northwest, and is taking its share of the heavy hauling entailed by this year's immense grain crop.

That is the way in Canada. A railway is no sooner talked of than the farmers move into the country it is to cross, and by the time the rails are down and the cars are running, the grain is there to fill them.

In a country so generously large as

Canada one expects an enterprise, if undertaken at all, to be on a broad scale, but the irrigation project in southern Alberta near to Calgary is on a scale to surprise even those who, knowing something of the country, expected much. When it is completed, main and secondary canals will supply water to 3,000,000 acres, the largest area of irrigated agricultural land on the continent.

The water for this Calgary enterprise is from the Bow River, and the Bow River is fed from the melting glaciers of the Canadian Rockies; therefore the supply is sure. And the individual farmer is assured of his water rights, once he has secured them, it being a law of the Dominion that all river water is the property of the crown and the regulation being that the water goes with the land. In the western division of the block the work is already completed. In the central and eastern divisions it is progressing rapidly. Many people have already grasped the idea that unlimited sunshine and a water supply on tap mean an insurance of crops irrespective of weather, and this irrigated district is filling up very fast. Ninety-three per cent. of the settlers are Americans.

A unique enterprise of the past year was the creating of a new port, Key Harbor, on Georgian Bay, the immediate cause of its founding being the development of a great iron mine eighty miles to the north. The docks, which are a part of the Canadian Northern system, will be able to ship daily 8,000 tons of iron ore to American lake cities. This port will be a great depot for north and south, and east and west-bound traffic. But another large body of soft iron ore, similar to the ores of the Mesaba range, and of a high grade, has been found at Gun Flint, Minn., at the end of the Canadian Northern Railway (Port Arthur, Duluth and Western Branch), and this ore will be shipped to Port Arthur furnaces to mix with the hard ores of Atikokia. This will probably mean another line of the Canadian Northern to Duluth. In addition to carrying the ore to Port Arthur, the road would move timber to Duluth to be cut.

These activities of rail and field are significant, but they indicate rather than disclose the operation of elements which are forming the country so fast that the face of it changes from year to year. A fair idea of the kind of people who are moving in from the States is given by the traffic in lands—the actual purchase of lands for cash, instead of earning them by homesteading. Here are a few instances:

J. F. Luse, of St. Paul, has during this year bought and sold 162,000 acres. In the same time, William Pearson, of Winnipeg, bought and sold 150,000 acres. Colonel A. D. Davidson recently closed a sale to J. E. Martin, of Minneapolis, of 145,000 acres forty miles northwest of Regina and fifty miles southwest of Saskatoon, in the Goose Lake country along the South Saskatchewan River. Mr. Martin operates a big farm in the Milestone country and will colonize largely from Minnesota and Iowa. Davidson & McRae have sold over 5,000,000 acres during the year. In these cases the buyers were all from the States.

There has been a mistaken impression, not yet wholly removed, that this new country which has just now left off being the "last west," is exclusively a grain field. As a matter of fact it has a large and increasing system of dairying which the government is fostering by building the creameries and marketing the products for the dairymen. While it is no longer a cattle country, it has gone heavily and successfully into stock raising, from sheep to horses. It has inland fisheries that yielded about $1,500,000 last year; and in the towns manufactures are being established in a wider variety and on a scale that is rising all the time. It is distinctively and first, a Kingdom of Wheat; but it has all the producing power necessary to make a country industrially and commercially complete, as well as the power to grow the world's richest and finest grain.

This land, with its allurement of promise and its ability to make the promise good, means more to the English-speaking peoples than has yet been guessed, and especially it means much to the farmer in the northern United States. That farmer is beginning to realize this truth, as the transactions in land will show. It is among the things to be shown as events arrive out of the future, whether in fact the real home of the English language shall not be here—a country where not only will English be the one tongue, but where all but a fractional part of the population will have derived their language from age-long ancestry, on either side of the ocean.

*The Duties of the General Government in the Restriction of Tuberculosis.**

Governments are formed for the security of the property and lives of its citizens. The government protects the property and lives of its citizens against foreign foes. The citizen entrusts his property to the commerce of the world; his ships may visit and engage in trade in any port on the earth; and his merchandise is safe in any civilized country. At home he is free from the danger of attack from those of other nations, and so long as he properly behaves himself he may travel around the world knowing that the strong arm of his own government and the laws of equity that prevail among nations give him security of property and life. At home he is protected against the lawlessness of his own country, and the best government is that which deals justice and equity to its citizens impartially, with no discrimination in favor of class or individual. The government maintains a navy for the protection of the property and lives of its citizens against possible foreign foes, and for the suppression of riot and rebellion within its own borders. In the United States of America the general government regulates interstate commerce and endeavors to protect the citizens of one state from frauds that may be attempted by those living or doing business in other states. All this is proper and wise, and the government that does less than this is a failure, and its continued existence cannot be justified, but in this enlightened age a government should do more than this. Science has shown that disease is one of the most destructive agents to both property and life, and that many diseases are preventable; consequently the government that does not put forth every possible effort to protect the property and lives of its citizens against disease is not doing its duty. Tuberculosis is highly destructive to both property and life. From 150,000 to 200,000 citizens of this country die annually of this disease, and the financial loss entailed by sickness and death from this cause is quite beyond computation, to say nothing of the physical, mental and moral deterioration that accompany this disease. My purpose in this paper is to point out some procedures that our general government should carry out in the suppression and extinction of tuberculosis. While the research of Villemin and others demonstrated beyond a doubt the infectious nature of tuberculosis, and the painstaking labors of Koch resulted in the discovery of the active infecting agent, there is much yet to be done in a scientific way before this disease can be extinguished, and success in this crusade against this disease, like success in all other great undertakings, depends upon exact knowledge of details. I will enumerate some of the things that, in my opinion, our general government should do.

The relation of human to bovine, avian and piscine tuberculosis, also the relation of the bacillus deserves more exact and thorough study. The possibility of modifying the bacillus by passage through more or less resistant animals should be investigated. The influence of light, of restricted or abundant air supply, of exercise, of different kinds of food on the progress of the disease in tuberculous animals are matters of importance. The question of heredity in the transmission of tuberculosis is by no means finally settled, and its importance in attempting to stamp out the disease is great. Should the tuberculous individual beget or bear children, and if he or she does so, what is the effect on the course of the disease in the parent, and what the effect on the offspring. The facts, so far as they can be ascertained, should be learned and presented to the people. The problem of immunity and of arrest of the disease should be prosecuted most exhaustively. The influence of race, age, sex and condition of life on susceptibility to infection and on the progress of the disease is something concerning which all possible information should be acquired.

The chemistry of the bacillus and the cleavage products is an important matter. These bodies should be studied both chemically and toxicologically. This alone constitutes a record that may occupy many investigators for years, and it can be carried out properly only by means of extensive and costly equipment.

The disinfection of houses occupied by consumptives is a practical matter of great importance, and the same is true of the means by which the traveler may best protect himself from infection. All these and many other problems, which must be solved if the race is to rid itself of this disease, can be best done by investigators working in laboratories built, equipped and sustained by the general government, and the government should enter into and carry on this work for the following reasons: (1) It is for the public welfare. (2) It will demand the time and attention of men who should be relieved of the necessity of doing anything else. (3) It will require such expenditures that it can be best done under special official regulations and at government expense.

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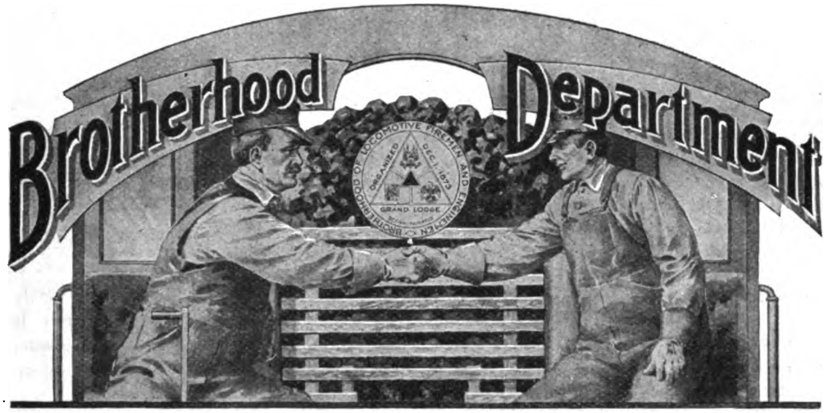
*By Dr. Victor C. Vaughn in The Public Health.



Farewell Letter of Brother John J. Hannahan, Upon His Retirement from the Position of Grand Master.

OFFICE OF GRAND MASTER,
PEORIA, ILL., Dec. 31, 1908.

To the Officers and Members of all Subordinate Lodges:

SIRS AND BROTHERS—I take my leave as Grand Master of the Brotherhood at the close of my present term after a long service among you, which embraces many of the positions from that of an ordinary member up to my present rank. I have been permitted to see, as few men have seen, a development of the splendid industrial labor body from a small beginning unto its present place of power, respect and stability. If I have had any considerable part in making the Brotherhood what it now is and bringing it to its present development, then any sacrifices that I may have made have been more than compensated for by the pleasure I feel in knowing that a vast army of men have bettered their condition permanently and have gained respect generally through the workings and development of this Brotherhood.

In taking my departure from you as an officer of the Grand Lodge and as your Grand Master, I close a career among you that has been extensive and varied. I became a member of the Association on January 3, 1881, when as a fireman I was initiated into Lodge 50 at Chicago, Ill., and within two years thereafter, at Denver, I was elected on the Grand Executive Committee on September 21, 1883, and served as chairman of the same. At Philadelphia later on, September 28, 1885, was elected Grand Organizer and Instructor, and was also chosen as Vice Grand Master at the time. After the abolition of the office of Grand Organizer and Instructor I was elected in 1886 as Vice Grand Master, and in that capacity served the Brotherhood until July 1, 1902, when I assumed the office of acting Grand Master to fill out the unexpired term of the late lamented F. P. Sargent, who had resigned. At Chattanooga, Tenn., on September 22d of that year I was chosen as the Grand Master of the Brotherhood, and served until the 31st day of December, when my term of office expires and my duties as an official of the Grand Lodge cease, but my membership will continue and my interests and purposes will ever be in common with your own.

In the interest of our organization I have traveled 861,073 miles and have undergone all the inconveniences and hardships that were essential to reach every point of the country to there meet the firemen, and was required to meet every condition that presented itself to overcome the opposition that was first thrown in the way of our body while it was in its infancy.

It is but stating a fact well known to say that labor cannot boast of any organization that has done less harm and done more good generally than has our Brotherhood. Numerically we are as strong as a great army, and through the protection of our insurance and home for our injured and enfeebled the day cannot be reasonably expected when either any part of that membership or those dependent upon them will descend from the dignity of independence and comfort. Our treasury is ample; our payments prompt, and a spirit of generosity sufficiently inculcated in our Brotherhood that membership in it is a guarantee against the degradation of worldly neglect.

The growth of our membership has been constant and is still increasing. I joined Lodge 50. The last lodge organized is number 760. Then but a few roads were organized. Now wherever a track is laid and an engine drawn we are either firmly organized or the condition of our people is better, because we are organized. Our numerical strength has increased from a mere handful to nearly 70,000, and our advancing wages have kept up fully with the prosperity of the country and the dignity that labor generally is assuming. Beyond the material advancement and fraternal spirit that has been fostered, our Brotherhood has likewise assumed a place in the affairs of the nation's industrial world that is most gratifying. We are no longer despised and combated, but are accepted as one of the great industrial institutions of the country at the present day. With methods that are neither arbitrary nor arrogant, but with patience and forbearance, we have continued to insist upon our rights, and the Brotherhood is now recognized as a body that keeps its contracts inviolate, employs no means to attain its end other than those that are honorable, and always rendering the best service that skill and intelligence can yield, while it presses for every advantage to its membership that is dictated by reason and fairness. It is with sacrifices that we have all worked together and attained this end, but we have reached the standing of financial stability, splendid membership and the best business character and responsibility, and it is that kind of an organization that I leave to my successor. I shall leave the industrial life for that of a commercial one, having been chosen to a place of responsibility without my own solicitation and solely because my long association with you has made my present associates believe fully in me. The general rule that commercial enterprise yields the greatest reward will be true in my case, but while my financial gains are greater, I shall suffer a great loss in the personal benefit and advantage which comes from a long and intimate association with the officers and members of your Brotherhood that has received my best efforts for nigh on to a third of a century.

Wishing the organization and each and every member thereof and those dependent upon them the fullest measure of success and prosperity, sincerely trusting that the onward march of the organization will continue, as your retiring Grand Master I bid you farewell.

Sincerely and fraternally yours,
J. J. HANNAHAN,
Grand Master.

NOTE.—Letter was received too late for publication in the January issue.—(Editor.)

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Shandy Maguire Retired.

Patrick Fennell (Shandy Maguire) the Railroad Poet, who for almost forty years has been in the employ of the Delaware, Lackawanna and Western Railroad, has retired from active service and has been placed on the company's pension list. He has laid down the arduous duties of railroad life that he may the better

"Husband out life's taper at the close,
And keep the flame from wasting by repose."

Brother Fennell entered the employ of the D., L. & W. R. R. as a locomotive fireman, June 18, 1869, and was promoted to the position of engineer June 18, 1870. In 1876 he was appointed roundhouse foreman at Oswego, N. Y., and held that position up to the time of his retirement.

At the Cincinnati (1892) Convention of our Brotherhood he was made a grand honorary member of our order. He began work with the Lackawanna in the early days of railroading and soon became a "fixture," winning for himself general recognition as one of the most faithful and trustworthy employes on that system. Shandy belongs to a class of enterprising and progressive railroad men who, while physically hardened by toil, are kind and tender of heart and ever watchful for the care and safety of others.

Being much interested in the cause of education Brother Fennell has for some time filled different positions on the Oswego Board of Education.

The name of Shandy Maguire has become a household word in the homes of thousands of railroad men. Amongst his poetry can be found some of the richest and most meritorious of its kind ever written. Some of his first productions were composed in the cab of his engine.

He has arranged for a trip to Europe. The greater part of his well-earned vacation will be spent in Great Britain and Ireland, and much of it will be devoted to visiting the scenes of his boyhood in Erin's Isle, where he first saw the light of day. While in the United Kingdom he will be the guest of the Associated Society of Locomotive Engineers and Firemen. We heartily wish Shandy a pleasant trip, a safe journey, and a long life to enjoy the rest he so well deserves.

Arrah, Shandy, mabouchal may good luck attend you,
And cling to you closely wherever you go,
And the best of good cheer with your life ever blend, too,
And the griefs of the roundhouse no more may you know.

Shure our hearts you've delighted,
With rich rhyme and poem,
And now that you're going to wander awhile
In the little green isle where you saw your first home,
May sweet recollections your hours beguile.

May the song of the thrush and the lay of the blackbird
That will greet your glad ears in Old Granuaile,
Lull your senses to re'listic dreams of your childhood,
And all of its joys bring you back in the full.

And when through with your rambles beyond the great ocean,
With your rhymes and your poems, which to cheer never fail,
May your heart and your soul still be filled with the notion
To gladden America's boys of the rail.

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A Brotherhood Sheriff.

It will be interesting as well as pleasing to our members to know that the sheriff of the largest county in the United States is a member of our Brotherhood. The brother enjoying this distinction is Orren H. Smith, of Silver Mountain Lodge 327, Needles, Cal. His election is attributable to the efforts being put forth of late by organized labor to place men from its own ranks in public office. The campaign which resulted in Brother Smith's election was hotly contested, but as a result of the support given him by the wage-earners, regardless of their political affiliations, he won out, notwithstanding the fact that the opposing party was very much stronger in his county than the party on whose ticket he was a candidate.

O. H. SMITH, Lodge 327
Sheriff of Lincoln County, Nevada

Lincoln County, Nevada, of which Brother Smith is sheriff, is 241 miles long and 88 miles wide, and contains over 18,000 square miles. It is as large as the states of Massachusetts, Rhode Island and Connecticut. Brother Smith resides in the mining town of Searchlight, and has only been a resident of Lincoln County for the past three years. He was born in Portsmouth, Ohio, February 13, 1876, but has lived for the greater part of his life in New Mexico, where he commenced railroading. He was with the Santa Fe for years and was running out of Bakersfield at the time he resigned to go to Searchlight.

Brother Smith's success at the polls,

as well as that of the congressmen referred to in this and last month's issue of the Magazine, is conclusive evidence of what wage-earners can accomplish in placing men from their own ranks in public office if they will but stand together at the polls. The Magazine extends to Brother Smith its best wishes for a most successful administration.

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Instructive Talks by Road Foreman in Jersey City, N. J.

Adopted Daughter Lodge No. 3, of Jersey City, N. J., announces that George Headdon, assistant road foreman of engines of the Pennsylvania Railroad, N. Y. Division, is conducting a series of practical talks for the benefit of enginemen and firemen under the auspices of the educational committee of the R. R. Y. M. C. A., 200 Baldwin avenue, Jersey City, N. J., every alternate Monday evening. During February he will speak on the evening of the 1st and 15th.

These talks are being made with a view to preparing the men for a series of examinations which will be submitted later in the season. Those men making the most creditable showing will receive special consideration. No one in engine service who can possibly attend and who is interested in his own future welfare can afford to miss these lectures, as they are designed to aid firemen in their efforts to qualify for promotion and to help enginemen to become thoroughly posted in all matters pertaining to the proper handling and care of the locomotive.

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Bro. Frank N. Gear Honored by B. of I. T.

Brother Frank N. Gear, of Lodge 10, Cleveland, Ohio, one of the old-time wheel-horses of our Brotherhood, and who for a number of years has most efficiently filled the important office of secretary of his lodge, has recently been the recipient of a new honor, having been chosen as Assistant Grand Secretary and Treasurer of the Brotherhood of Interurban Trainmen, with offices at Cleveland, Ohio.

Brother Gear began railroading on the Erie Railroad in the early '80's and joined our Brotherhood over twenty years ago. During that time he has held every office in a subordinate lodge, and has filled the offices of secretary and collector of his lodge, Forest City No. 10, for the past twelve years, being the present incumbent. He has been general chairman on the old N. Y. P. & O., and Chicago and Erie Railroads, now a part of the Erie System, and has had wide experience in the protective department of the Brotherhood. Brother Gear has the distinction of having attended every convention of the B. of L. F. and E. since that held at Atlanta in 1888. He is a native of Ohio, having been born near old Lake Erie in that State.

FRANK N. GEAR
Assistant Grand Secretary and Treasurer, B. of I. T.

By a special enactment of the Cleveland Convention of the Brotherhood of Interurban Trainmen, held in 1906, Brother Gear was admited to honorary membership in that organization, and has now been chosen as its Assistant Grand Secretary and Treasurer, his term of office expiring in May, 1910.

His host of friends and acquaintances will join in wishing Brother Gear the fullest measure of success in his new position.

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Sparks.

Now that we have started on another new year let us all take a deeper interest in our lodge, attend its meetings regularly, and find out for ourselves how things are going. Nothing tends to make a lodge grow more quickly than brisk, lively meetings, and wide-awake, interested members. Do your part and you will be well rewarded by the pride you will feel and the benefit you will experience in the development of your own lodge.

Important! What is? That you should have in your possession one of the charts of the new No. 6 ET Locomotive Brake Equipment, which can be secured, together with printed matter, by sending 15 cents to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Bro. E. C. French, honorary member of Lodge 39, has back copies of the Magazine for the year 1908 complete, of which he is willing to dispose. Interested parties should correspond with E. C. French, care State Hospital, Clarinda, Iowa.

It is not fair to our members that men who are eligible to join our Brotherhood should remain outside its ranks and thus enjoy all of the advantages which it has secured for those of our calling without contributing their share of the expense and effort essential to maintaining them. The manly thing for such men to do is to become members of the Brotherhood of Locomotive Firemen and Enginemen without any further delay.

It has always been one of the foremost desires of the Editor and Manager to see that each and every brother receives his Magazine regularly each month. He cannot, however, carry out his wishes in this respect unless he receives the hearty co-operation of every member, so when you move DO NOT FAIL to drop this office a request for change of address.

A bound volume of the Magazine for 1907 will be sent prepaid to any address in the United States, Canada or Mexico upon receipt of $2.50. All orders and remittances should be sent to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Bro. Garrett L. Butler, of Liberty, Miss., has back numbers of the Magazines for the years 1905-6-7-8, with the exception of a few numbers missing in 1905-6, of which he is willing to dispose. Interested parties can correspond with him at above address.

When changing your address be sure to notify the Editor and Manager immediately, otherwise your Magazine will continue to go to the old address or be dropped by the postmaster. Compliance with this request will be much appreciated by the Editor, as he is very desirous that each and every member receive his book regularly each month. Send your notification to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

The new No. 6 ET Locomotive Brake Equipment Charts, which we are selling for 15 cents, together with descriptive matter, are proving of great value to the railroad man who is anxious to equip himself with every facility for advancing in his chosen profession. Send your order to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Bro. W. F. Snider, honorary member of Lodge 470, has bound volumes of the Magazine for each year from 1888 to 1899 inclusive, of which he is willing to dispose. Interested parties will please correspond with him direct at his address, which is W. F. Snider, Route 4, Murphysboro, Ill.

After elections have taken place and changes are to be recorded in the Directory, it will facilitate the work of the Magazine office and insure accuracy if the notices of changes of officers and their addresses be sent with as little delay as possible direct to the Editor and Manager. All notices for change of meeting place of lodge or of dates of meetings should also be sent direct to the Magazine office.

Brothers, remember that the more active and alive is our membership the more effective will be the Brotherhood. Indifferent members are a drawback to the success and prosperity of any organization. Every man in the Brotherhood should be filled with the determination to do his full part in the work of increasing its membership to at least 90,000 before the St. Paul convention, and if each member will put forth a reasonable effort we can exceed even that number. Every brother should have an application in his pocket, ready to hand to men outside our ranks who are eligible to membership in the Order and whom he can influence to join.

Bro. Charles Bevington, of Lodge 566, writes the Magazine office that he has left the railroad and entered the real estate business, with offices in Fresno, Cal. He further states that all visiting brothers will be welcome to call at any time, also that any correspondence relative to the Brotherhood in the West or the country in California will be cheerfully answered.

By changing the date of issuance of the Directory to the third month of each quarter, there will be ample time for all lodges to report the names of their newly elected officers and have them included in the first issue of the Directory following such election.

If you are looking for full and complete information on all the latest improvements in the railway mechanical world, you can do no better than purchase bound volumes of the B. of L. F. and E. Magazine for 1907 and 1908. Same will be sent to any address in the United States, Canada or Mexico, prepaid, upon receipt of $2.50 each. Remit to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

We are sorry to state that notwithstanding the numerous requests we have made to our readers to sign their letters for publication, communications still continue to come in unsigned. If the writers will sign their names their letters will be given prompt attention and names will be withheld if so desired, but when they come in unsigned we can take no notice of them.

If you wish to have a copy of our Catechism of the Electric Headlight you should order early. The heavy demand we have had for this useful little book is excellent proof of its efficiency as a textbook. Send your remittance (50 cents) for one direct to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Bro. J. W. Erdemiller, of Lodge 395, has written this office that he has a complete file of the Magazine since December, 1900, of which he is willing to dispose. Interested parties should correspond with him direct. His address is 2348 Wilson street, Wheeling, W. Va.

If you are ambitious to climb to the top of the ladder of success in the railroad world you cannot afford to be without a copy of our little Catechism of the Electric Headlight, the price of which is only 50 cents. Remit to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Bro. F. J. O'Brien, of Lodge 731, in a letter to the Magazine office states that Kern River Lodge is coming to the front, retaining all of its old members and always adding new ones when the material shows up. He also states that business is good and that the indications are favorable for a prosperous year during 1909.

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FROM THE PRESIDENT

An Accident Indemnity Department.

During the sessions of the Eleventh Biennial Convention, some of the delegates there assembled believed that the time had come when it was to the interest of the Brotherhood and its members that a sick and accident benefit department be instituted and conducted by the Grand Lodge of the organization.

After considerable discussion it seemed to be the opinion of a vast majority of the delegates that it would be unsafe for the Brotherhood to undertake a sick benefit department because of the lack of knowledge of the losses that would have to be paid to sick members.

The final action of the Convention upon this matter was to instruct the Board of Directors to draft by-laws for an "Accident Indemnity Department." The Board of Directors, at its first meeting at Grand Lodge headquarters during the month of January, made a thorough research into accident indemnity benefits and found a large number of associations doing an accident insurance business in addition to the "old line companies."

It was found that the assessments charged by most of these mutual accident benefit associations were practically as high as those of the "old line companies," and therefore, even though members were eligible for membership therein, the expense would be considerable.

The Board of Directors have carefully prepared what they believe to be the most practical plan of an accident indemnity department and same will be submitted in the near future to a referendum vote of all members, as directed by the Eleventh Biennial Convention. The resolution requiring this referendum vote provided that, if two-thirds of the members who voted upon the proposition were in favor of its adoption, it would be adopted.

This new departure is one of the most important of any work undertaken by the Brotherhood in many years. Evidently the adoption of an accident indemnity department will be of great benefit to our members in-so-far as the assessment rates are cheaper than in other companies, but whether or not the adoption of such a department would be of benefit to the Brotherhood is a matter that each and every member should seriously consider when casting his ballot for or against the proposition.

The principal argument against the adoption of an accident indemnity department is the generous spirit which seems to prevail in the minds of most members when the interest of the individual member is at stake. The last Convention made allowances on illegal claims to such an extent that it required assessments amounting to $2.40 per member to pay them. All past conventions have shown a desire on the part of delegates to be generous and pay claims that would not be paid by any other similar institution. If this same spirit of generosity is to prevail in the approving of claims of the accident indemnity department, we will probably find that in the near future the rates necessary to maintain this department will be as high as with the "old line companies," and the "old line companies" only pay claims that they are obligated to pay by law.

Another important feature of an accident indemnity department that must not be overlooked is the disposition on the part of legislative bodies to regulate fraternal insurance affairs. The laws of the State of Illinois have made it obligatory upon our last Convention to change our laws as to the qualification of delegates, and these laws forbid any member of the Brotherhood acting as a delegate for the transaction of beneficiary matters unless such delegate is a member of the beneficiary department. The question arises, woud not these same laws sooner or later make it necessary for our delegates to be members of the accident indemnity department, if conventions are to pass upon the laws of this department? The Board of Directors had this in mind in the provisions they have adopted for the changing of the laws of this department.

It is evident that the delegates at the last Convention did not care to assume the responsibility of adopting an accident indemnity insurance when they directed that the matter be referred to the membership at large for a referendum vote. If the delegates realized the seriousness of the matter and the responsibility resting upon them, then each and every member who votes upon this question should realize the same responsibility and only vote as he truly believes is for the best interests of our Brotherhood.

A Useless Slaughter of Men in Train Service.

During the fiscal year ending June 30, 1908, the Brotherhood of Locomotive Firemen and Enginemen paid thirteen death claims resulting from accidents caused by obstructions too near the track. The average number of deaths from this cause suffered by members of the Brotherhood have been more than one each month for several years.

The reports of the Interstate Commerce Commission show that during the seven years ending with the year 1907, obstructions too near the track have been the direct cause of deaths and injuries as follows:

	Killed.	Injured.	T't'l.
Enginemen	60	330	390
Firemen	66	632	698
Trainmen	63	644	707
Other employes	9	43	52
Total	198	1,649	1,847

An investigation of circumstances connected with these accidents (if they can be called "accidents") would probably show that the wide cabs of modern locomotives and the large cars now in use were the causes of a majority of the deaths and injuries. It probably would be found that overhead bridges which sufficiently "cleared" the cabs of the old-style standard engines are now barely wide enough to permit the passage of a modern "battle-ship."

It would seem that as enginemen are usually leaning out of the cab window they would be in more danger than firemen, but the fact is that enginemen ordinarily can see an obstruction in time to avoid it. Not so with a fireman who, half-blinded by the glare of the firebox, seeks a moment's rest upon the seat-box.

Firemen, in addition to other duties, are commanded to "look out for signals" —and then obstructions are placed so near the track that to obey the command often results in death or serious injury.

Mail cranes are destroyers of many lives. Usually set at a distance from the tracks most convenient for the width of mail cars, these dangerous devices now barely "clear" engine cabs, which have become wider and wider as the mania for more powerful engines has asserted itself.

Is it not time for those responsible for this terrible and useless slaughter of men in train service to remove the cause? Or will it be necessary to call upon Congress and state legislatures for relief?

As never before, men of prominence are interested in the saving of lives of railway employes. Public addresses and signed magazine articles in great number treat of the awful loss of lives and limbs by employes of American railway companies.

The automatic coupler law, and other laws enforcing the adoption by railway companies of life-saving devices, are among the most humane of modern legislative enactments.

The enforcement of these safety appliance laws is most difficult. It requires the constant vigilance of the Interstate Commerce Commission, through the untiring energy of a score of inspectors, to secure their observance.

If railway officials could once be brought to a realization of the responsibility that truly rests upon them, undertakers would be less prosperous. This feature of the matter was forcibly brought to the attention of the Master Car Builders at their last convention by Mr. Edward A. Moseley, Secretary of the Interstate Commerce Commission, when he said in an address:

> "Each of you as the Master Car Builder of your road, should take the most painstaking care to see that every car owned, used or handled by your road, complies with the M. C. B. standards in all particulars. A car used today by a road in Maine may be handled next week by an employe of a road in Illinois. In the darkest hour of the night that employe's life may depend upon finding the grab-iron, ladder or other safety appliance in the same location upon every car, and it is not too much to expect that the standards you have adopted or may adopt shall become as binding as any statute enacted by Congress. . . ."
>
> "I regret to say that the necessity of prosecutions for violation of the safety appliance law still continues. As evidence that suits have been properly brought, and in a spirit of fairness, I will say that prosecutions involving 2,260 vio-

lations have been filed in court. Of this number 1,041 cases have been disposed of by trial, confession of judgment, and compromise, and penalties have been collected to the amount of $80,200. Twelve cases have been dismissed by the government, and in 1,207 cases trial is pending. In but ten cases have decisions unfavorable to the government been rendered. Most of these cases have been appealed, and it is thought probable that in the higher courts the government's contention may be sustained. This record of law enforcement, it is believed, cannot be equalled. Great progress has been made by carriers during the past year or two, and the general condition of equipment throughout the country shows such marked improvement that we believe the time is near when these appliances will be kept in the highest possible condition of repair and the necessity for prosecutions will be largely eliminated.

"Gentlemen, great responsibility rests upon you in the performance of your duties. From deductions based upon reports made to the Commission, I find that every two hours and fourteen minutes a railroad employe is killed, and one is injured more or less seriously every seven minutes with the regularity of clockwork. During the few minutes that I am speaking here today at least two employes have been injured, and between the time this convention was called to order this morning and its adjournment this afternoon it is certain that two railroad employes will have given up their lives. This one fact will impress upon you in the most emphatic manner your solemn responsibility to railroad employes and the public. . . . ."

"The man at sea who saves a human life, the man upon a railroad who, at the risk of his own life, saves or attempts to save the life of another, is rewarded with a medal from the Nation. So, also, the consciousness of duty well performed is the reward of the Commission's inspector, who, by his untiring efforts, contributes effectively to the preservation of life and limb. For what greater gratification can come to a man than that derived from the knowledge that by his efforts some human life has been saved to family and to country? Just so in your deliberations in your annual conventions, and in your work when you go back to your various fields of labor, you can always bear in mind the inspiring thought that you are contributing to the safety of employes and the traveling public by maintaining your equipment in the highest possible state of efficiency. . . ."

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FROM THE GENERAL SECRETARY AND TREASURER

To Financial Secretaries.

From reports received at this office it would seem as though there is some apprehension on the part of financial secretaries that they are going to have entirely too much to attend to when the time comes to begin the collection of monthly assessments. Information has been received that some financial secretaries have resigned, believing that the work to be performed under the new plan for paying assessments monthly will be entirely too heavy for them to handle.

I trust all financial secretaries will remain in office and at least give the monthly plan a trial. It will no doubt require more time and will involve more trouble to collect assessments each month instead of every quarter, but I believe that much of the work heretofore performed by financial secretaries is now going to be performed by the members themselves. I refer to the fact that some financial secretaries have had in times past to hunt members up to get their money; while now the members will hunt up the financial secretary to get their assessments paid. Every member will know just what amount is due from him on or before the first day of each month, and will put forth an effort to get his money in the hands of the financial secretary on time.

Section 152 provides amongst other things that the financial secretary shall pay to the treasurer of the lodge on or before the fifth day of each month all moneys collected by him from members, and shall accompany such payment with a full list of the names of all members from whom collections have been made, and that with each Joint Protective Board assessment levied and collected he shall furnish a full list of the members liable therefor. This calls for quite a large amount of labor on the part of the financial secretaries, especially in large lodges.

It will be the aim of the Grand Lodge office to do all that is possible to facilitate the work of all officers, particularly the financial secretaries and treasurers.

Forms are being now prepared that will be so arranged as to require but little writing on the part of financial secretaries to comply with the above provisions of Section 152.

It will be absolutely necessary to furnish the treasurer with this list of names, so he will know just by whom, how much and for what purpose money has been paid and for whom to remit to the General Secretary and Treasurer; also that there may be no delay occasioned the treasurer in getting his returns to the Grand Lodge office by the 20th of the month.

A financial secretary's record book will be prepared by the General Secretary and Treasurer that will require but little writing to keep it in such condition so that that part of Section 152 can be readily complied with which requires financial secretaries to make a report to the lodge each month of all moneys received and paid out by him.

Reporting Expulsions for Non-Payment.

One of the greatest helps to the Grand Lodge office as well as to treasurers of subordinate lodges will be the new law that makes it one of the duties of the financial secretary to report all expulsions for non-payment of assessments to the General Secretary and Treasurer.

When a member does not pay to the financial secretary of his lodge all assessments due on or before the first day of each month he expels himself, and it is the duty of the financial secretary to report the same to the General Secretary and Treasurer and not to the recording secretary of the subordinate lodge.

In order to show how much better and what a help this part of the law will be, not only to the Grand Lodge office, but to the subordinate lodge as well, I would direct attention to a case now pending in the Grand Lodge office. A member of a lodge was reported to the General Secretary and Treasurer as having been expelled on January 2, 1907. Since that time no money has been remitted by that lodge for said expelled member; but at this time, two years later, comes a communication from the secretary of the lodge saying the member had never been expelled, but on the contrary had always been one of their best paying members, and at times had paid two quarters in advance. Had it been the duty of the then collector to report to the then Grand Secretary and Treasurer all members who had failed to pay their assessments, such a mistake as this could not have occurred, as all know it was the duty of the collector in 1907 to report to the secretary such members as had been expelled for non-payment of assessments, and of the secretary in turn to report these expulsions to the Grand Secretary and Treasurer. Some one failed to perform the duties required of him, and we now have a man who the secretary says has at all times been in good standing; yet the records of the Grand Lodge office show he has not been a member for two years.

New Receipts.

New forms of receipts are being printed. They resemble the present receipt very much except as to change in color and in such other details as were necessary to meet the requirements of the new laws. They will be ready for delivery about February 20th, so that all will have a supply to begin issuing them as members begin to pay their assessments during the month of March.

Financial secretaries should be careful not to issue receipts to any member on one of the old receipt forms after March 1st, as to do so would place in said member's hands a receipt that would be a receipt for which money had been paid, but it would not be a receipt to meet the requirements of the new law.

Get Orders in Early.

Lodges should order a quantity of receipts as soon after February 1st as possible to be sure they have them by March 1st.

Bonding Treasurers and Financial Secretaries.

Arrangements are now being made to have all treasurers and financial secretaries bonded, and when this is done should either of the officers mentioned in any lodge desire to know the amount of bond carried for him it will be a pleasure for this office to furnish such information. In the meantime if any lodge desires any particular amount of bond for either of these officers, if they will file in the Grand Lodge office a statement of the amount of funds the lodge has on hand we will try and arrange the amount of bond so as to meet the wishes and requirements of the lodge.

Honorary Members.

Section 207 of the present constitution and 197 of the constitution in effect after March 1st provides that all members who have been paid their disability claim in order to retain membership and be entitled to participate in the affairs of the Brotherhood must pay local and General Fund assessments. All financial secretaries should collect these two assessments from honorary members, and the treasurer should remit to the General Secretary and Treasurer General Fund assessments for these members.

Murphy Monument Fund.

Received by W. S. Carter, Grand Secretary and Treasurer, from December 13th to and including December 31, 1908:

The following lodges have remitted $1.50 each: 2, 8, 21, 38, 50, 52, 58, 61, 77, 88, 91, 103, 115, 137, 156, 161, 237, 239, 248, 259, 262, 264, 272, 300, 313, 319, 349, 355, 379, 380, 395, 397, 416, 420, 448, 450, 464, 479, 481, 498, 506, 512, 541, 542, 567, 587, 623, 633, 645, 654, 656, 693, 694, 698, 699, 704, 719, 731, 737, 740, 751, 753	$93 00
Lodge 233	1 00
Previously reported	309 45
Total	$403 45

Received by A. H. Hawley, General Secretary and Treasurer, from January 1st to and including January 12, 1909:

The following lodges have remitted $1.50 each: 12, 18, 31, 32, 62, 162, 163, 173, 181, 182, 188, 225, 256, 301, 310, 315, 322, 337, 340, 348, 363, 373, 392, 405, 414, 422, 463, 465, 467, 489, 494, 501, 502, 523, 524, 527, 531, 538, 554, 651, 657, 677, 685, 702, 707, 725, 758, 760	$72 00
Total	$475 45

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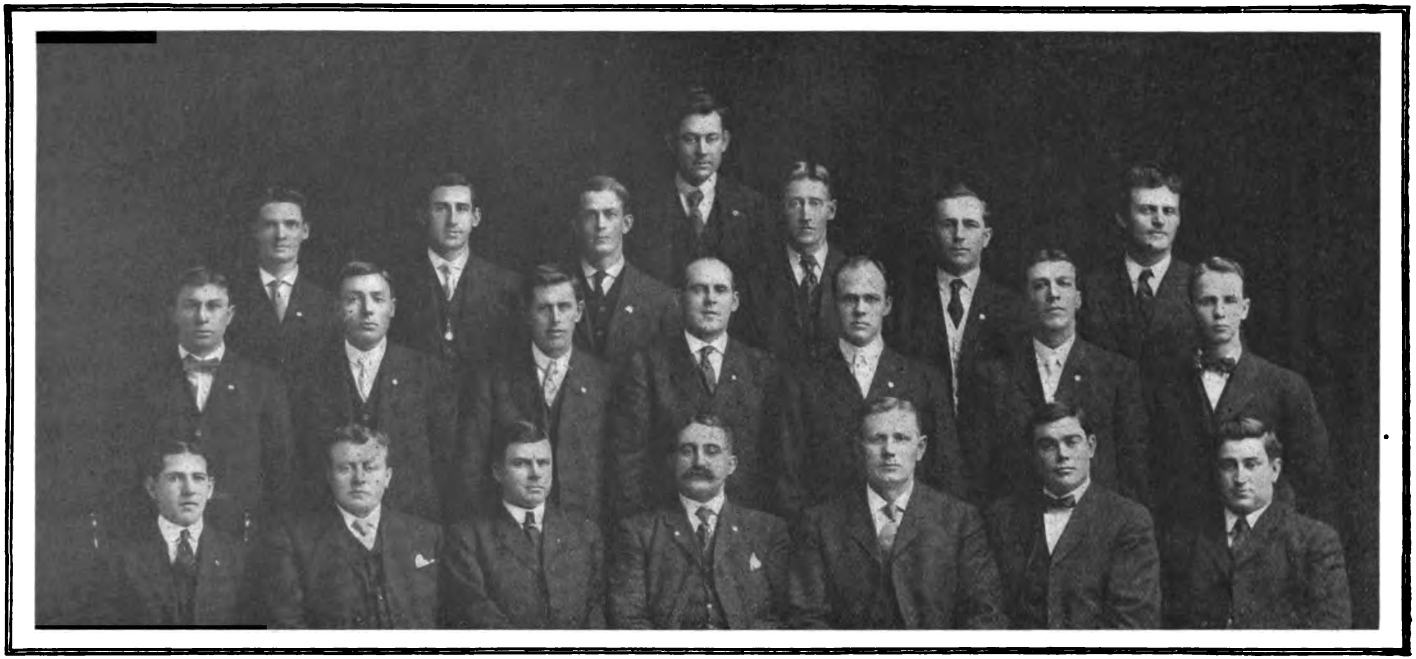
Forum

Assistant President Wilson Receives Well-Merited Honor.

Excelsior Lodge No. 11, in which Assistant President Wilson holds membership, held its regular meeting Sunday, December 27, 1908. Brother Wilson being present, was prevailed on to take the Master's chair. After the regular order of business had been transacted Brother Wilson was presented with a fine gold-headed cane on behalf of the members of his lodge. Past Master Bellings, who acted for the brothers in making the presentation, expressed their sentiments towards Brother Wilson in a most appropriate address. Brother Bellings' remarks were as follows:

"It affords me much pleasure on behalf of the members of Excelsior Lodge No. 11 to thank you for your many kind words of advice and encouragement to our membership. Thanks to the God who made us that our organization is privileged to have men of your type at the head of it. Neither erudition nor wealth is required that you may perform your



Top Row—A. S. Wright, E. F. Veale, F. Harker, F. McCleary, L. F. Fisher, J. M. Wisehaupt, S. L. Randall.

Middle Row—J. S. Hennes, F. G. Brown, H. Scott, G. W. Gowling, W. L. Hartley, W. Becker, V. Christiansen.

Bottom Row—G. J. Weldon, R. F. Greene, P. L. Gray, Vice-Chmn., S. R. Schauer, Chairman, G. F. Wulf, Sec.-Treas., E. A. Champlin, M. E. Ryan.

JOINT PROTECTIVE BOARD, C., M. & ST. P. SYSTEM good work. Your power comes from within, where great thoughts are born and nourished; your worth lies in yourself, as shown in the spirit in which you have always acted. Wherever your lot has been cast, whether as a fireman on the deck of your engine, as an engineer with hand upon the throttle, or as a representative of our great organization, you have ever been the same, pure in mind and heart, modest, brave, unenvying, always seeking to do your work well and conscientiously and absolutely without desire to shine so as to become a theme for idle tongues. You have become conspicuous only through the performance of your duty, and your reward is not in the money you earn, but in the consciousness of the good you have done in helping to make our organization what it is today. You have always held yourself aloof from controversy and intrigue and have ever been intent on the advancement of the welfare of those with whom it was your privilege to associate and whose interests have been in your keeping.

"We are proud of the honor that has been bestowed upon us as a result of your election to your present high and responsible position, and we confidently hope that the same success will attend your efforts in your new position that has characterized the performance of your duties as our First Vice-Grand Master. I assure you, Brother Wilson, that it affords me great pleasure to have the honor to present to you, on behalf of the members of Excelsior Lodge No. 11, this token of appreciation, and while its intrinsic value is small, we know you will accept it in the spirit in which it is offered, and when the cares and trials of life, the duties and responsibilities of office and the infirmities of advancing years have made their inroads upon your strength, we hope you may find it of some use, and that it will serve to remind you of your friends in No. 11. Brother Wilson, we wish you every possible success, and to both you and your family a happy New Year."

Brother Wilson responded in a very appropriate manner, and assured the members of No. 11 that it would be his constant endeavor to continue to merit their confidence and good will.

The meeting was one that will be long remembered by all who were fortunate enough to be present.

MEMBER.

Kind Words for Brother Hannahan—Resolutions Adopted by Illinois State Legislative Board.

Whereas, The Illinois State Legislative Board in its first annual session on December 19, 1908, had the extreme pleasure of hearing our Grand Master, Bro. John J. Hannahan, deliver his farewell message, containing words of encouragement relative to the future of our organization and of listening to his manly appeal to our brothers and to this board to give his successor their hearty cooperation in his work; and

Whereas, We, the members of the said Ilinois State Legislative Board, have the utmost confidence and faith in his integrity and honesty, which have been so well demonstrated in his past relations with our Brotherhood and is so clearly evidenced by its present condition,

Resolved, That we extend to our Grand Master, Brother Hannahan, this expression of our confidence and trust, together with the assurance that it is our earnest hope that the future holds for him a store of success, health and prosperity, and the further assurance that wherever we as men can render him as a man any practical aid of any kind, same will only be too gladly given.

Resolved, That our confidence in the honesty and integrity of Bro. John J. Hannahan is as firm today as it has ever been in the past.

Resolved, That we extend a vote of confidence to our worthy Grand Master, same to be recorded on our minutes, and that a copy of these resolutions be sent to Brother Hannahan and a copy forwarded to our Magazine for publication.

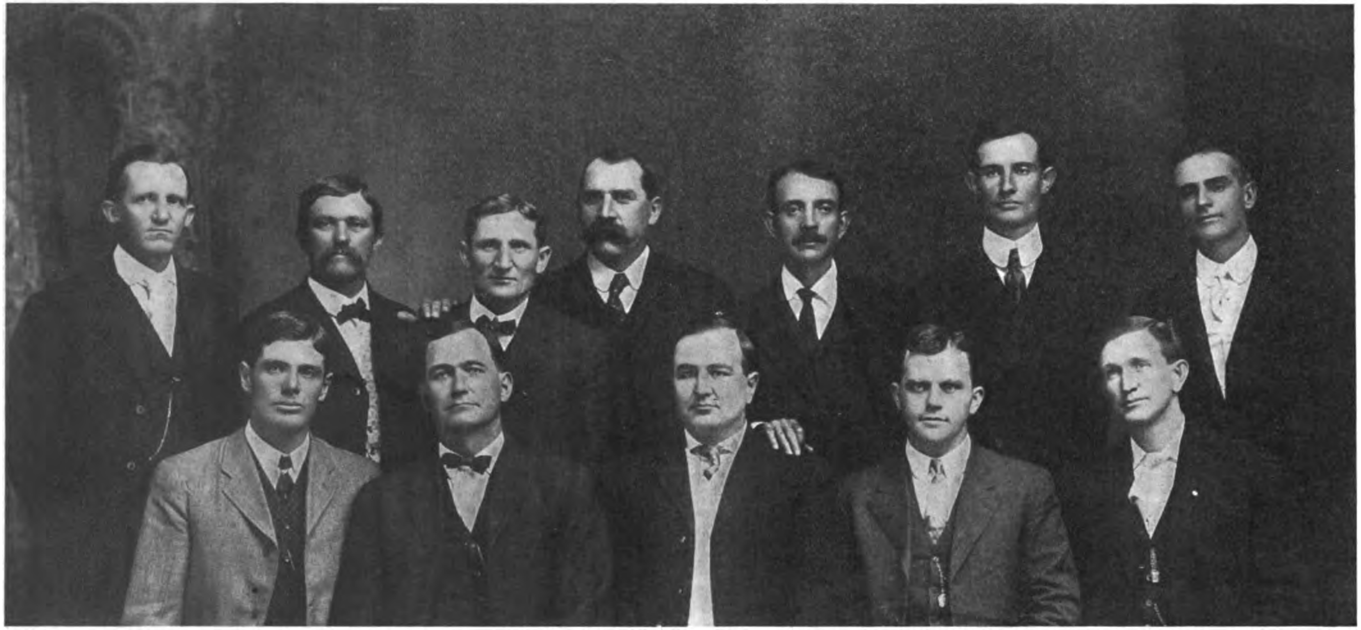
ILLINOIS STATE LEGISLATIVE BOARD.
GEORGE GODING, Secretary.
N. C. ALLEN, Chairman.

* * *

Sick and Accident Insurance.

As a brother stated in a recent issue of the Magazine, few of us, if any, are very well fixed financially. Quite a number of us depend on our monthly check to pay our grocery, fuel and other necessary bills. When a man is in good health and working he can keep up, but let some of us be taken down sick and nothing coming in, then that is where we go to the wall.

Now I cannot see or understand why the B. of L. F. and E. cannot pay a sick



A. C. Branham, 159 C. W. Cox, 159 L. P. Johnson, 243 C. E. Elliott, 159 A. C. Nichols, 177 T. J. Higgins, 740 W. H. Miller, 372

E. Ellis, 664 W. O. Cash, 616 M. F. Barnett, Gen'l Chairman T. A. White, Sec.-Treas. W. H. Reed, 70

JOINT PROTECTIVE BOARD, TEXAS AND PACIFIC RAILWAY benefit from the money we pay in. For myself, I am in Class A, $1,500, paying $5.50 a quarter; $2.50 Grand Dues, and after April I will have to pay $2.15 a month, which will be $25.80 a year. Now, as I am not in the transportation department, but am in the motive power department, stationary work, I am no expense to our lodge whatever. They have no grievances to adjust for me, so I think the money I am paying in should entitle me to a sick benefit, say $4.00 to $6.00 a week, any way. I am hoping I will not be taken sick, but it is always safe to prepare for adversity in time of health. In the department in which I am working now my wages are small. I have a wife and two children to support, and my check isn't anything like what it was when I used to be on the footboard. I wish the brothers would give this their consideration and let us have their views on the subject.

JAS. A. FUGITT,
Lodge 532.

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Expressions of Confidence In and Good Will For Past Grand Master Hannahan.

The following resolutions expressive of good will to Bro. Hannahan were adopted by the Indiana State Legislative Board during its recent meeting in Indianapolis:

Whereas, our worthy Past Grand Master, John J. Hannahan, is unable to meet with us today, and

Whereas, he has rendered the Indiana State Legislative Board inestimable service during his twenty-three years as a Grand Lodge officer, and

Whereas, Brother Hannahan has always been found true in the hour of supreme trial, and gave an example of the virtues of courage, fidelity and sacrifice, and

Whereas, values are obliterated or reversed when great men are to be honored, and the highest prizes like the highest services cannot be measured, but only expressed in symbols, therefore be it

Resolved, As the supermost sign of our affections, we will spread these resolutions on the minutes of our meeting and send a copy to our worthy Past Grand Master, and a copy to our Magazine for publication.

W. E. TRIPPEER, Sec'y.
RICHARD WITTY.

Indianapolis, Jan. 5, 1909.

Our Brotherhood.

Brothers, here we are facing a new epoch in the history of our Brotherhood. We should not lose sight of our prosperity in the past and we should remember that all our success in the future solely depends on our loyalty. Our order has reached a stage in its development where we dare not allow our sympathy to create discord or lack of confidence in our Brotherhood because of any dissatisfaction that may prevail regarding the expense created at our last convention.

Now, brothers, as we are living under a capitalistic government and we find the rich piling up and adding daily to their wealth while the poor are becoming poorer and men are being schooled to study the problem of how to destroy organized labor, I say it behooves us to look around and ask ourselves the question: Is labor a commodity, and if so, have we a right to sell it as of old? It has been said, "In unity there is strength;" then let us get closer together and use the password "Economy." I do not wish to be understood as arguing the economy question, but am only stating facts as I find them, and leave you to draw conclusions.

We have been going through a financial panic, and in the manufacturing districts it has been most keenly felt. Many of our brothers have been out of work, and there is as yet no sign of their getting back to their former positions, and in many instances lodge treasuries have been drained trying to keep them in good standing with our Grand Lodge, which it is our duty to do. Yes, I even know of brothers of our Order whose loyal wives have gone out and done washing and cleaning, and the husband, out of work, kept and cared for their dear little ones while the mother was earning what she could to purchase food and pay the Brotherhood dues so that he could remain in the Order.

Now, then, how long can this strain be endured? Could we not adopt the password "Economy" and hope for better things and act in accordance with that hope, and as our worthy Past Grand Secretary and Treasurer Brother Carter has been selected as our new captain of the ship let us all rally to his side and see if the future which is ours can still be made better for all. I do hope that the time is not far distant when we will have a consolidated motive power organization in America as they have in England, as Brother Fox so ably presented the situation to us, for there is no grievance of any man on a locomotive that does not affect his fellow man on the other side. I care not which side of the cab it be, the grievance of one is the concern of all, so let us hope and pray that God may speed the day.

MEMBER OF 637.

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Shine Inside.

In the large cities of almost any country one of the familiar sights is the bootblack's sign "Shine Inside." It is a business proposition with him, but its application to much wider thought can be made by one who notices it and has a moment of meditation and retrospection.

The question of "shining" is one of great importance, and we all put much stress upon it. Every man who is self-respecting and broadminded wishes to gain the regard and esteem of his fellow men, but in this "shining" we are apt to be too eager to "shine" outwardly.

It is recognized as one of the essentials of business success to appear neat and well groomed. No man in these days who does not give careful attention to his personal appearance can obtain much attention from the world at large. This does not necessarily mean that a man is measured merely by the clothes which he wears, but it does mean that a man's capacity and character are strongly indicated by the care which he gives to his personal appearance. Young men of today are attractive in business and social circles because of their scrupulous and "nifty" way of dressing. This is commendable; it is not to be discouraged. But care should be taken that men do not allow themselves to become contented with merely appearing neat. The true sources of character and motives of conduct lie *within.* We need to have a more earnest purpose to live clean lives, so that clean and well-made clothes will be merely an index to the *really clean* man within us. This it is to be a gentleman.

This is what made John Halifax such a lovable character, fascinating every reader of the charming story when it was so popular a half-century ago, showing him to be the true definition of the man who "shines inside."

The Real Gentleman.

A gentleman is one who is clean inside and out, who neither looks up to the rich nor down on the poor, who can lose without bemoaning his fate, and win without bragging. He is a gentleman who is considerate of women, children and aged persons, who is too brave to lie, and too generous to cheat, and who takes his share of this world's goods and allows others to have theirs. After all it is only the man who "shines inside" who is true to the core, who has lasting happiness. Though there is much in life to make us skeptical of others, nevertheless it is one of the incentives to nobler action to realize that all about us are men, in various pursuits of daily doing, who are generous, honest and clean. It is not only true of men, but of institutions if they are to have any abiding place in the annals of history, they must "shine inside."

It is the proud and glorious record of the B. of L. F. and E. that, not only does it offer the boys who have not come into the "fold" splendid inducements to become members, but when they become acquainted with its works in the lodge room they appreciate the Grand Old Order to a much greater degree than they had supposed they would. Every member of the Order should do all in his power to "shine inside" the lodge room at all or some of the meetings, knowing that the love and pride of its membership in its prosperity and progress will be determined most largely by the inner atmosphere of the lodge room.

JOHN T. CLINE.

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Correspondence

LODGE 40—(*E. J. Sims, Bloomington, Ill.*) Business on "The Only Way" (The Alton) is good and brisk at present and we are hoping it will continue so. Our motive power is kept as good as conditions will permit at all seasons of the year. The management has just let an order of $350,000 to the American Locomotive Works for ten consolidation, heaviest freight engines, five Pacific type passenger engines, and five latest switchers, all engines to have Baker-Pilliod valve gear—a gear in many particulars similar to the Walschaert valve gear, of which pattern (Walschaert) we have five at present, they being Pacific type passenger engines. Our traffic is mostly coal, mined in South Central Illinois, with a fair sprinkling of perishables—meat, stock and merchandise from Missouri points and Illinois bottoms, combined with the usual foreign shipments, causing a pretty fair business all the year round.

Our passenger traffic is second to none in the country, new runs being put on here in the dullest period (last April)—a joint Alton-Katy express service known as the "Nightingale," having been introduced. The "Nightingale" is a close rival of our famous "Red Hummer" between Chicago and St. Louis, and the "Alton Limited" still remains the peer of every train leaving either terminal, and that is saying something. The engines are painted red (Pacific type), the coaches are the regulation color, and the engines are used for all runs. Our company is just introducing a strong motor car, "Irene" (gasoline electric), to run over a stretch of 53 miles of double track in competition with interurban system, such action necessitating the taking off of a two-car plug and crew. This motor carries a trailer and will make two round trips a day. This is the forerunner of extensive experiments in this direction, as the country around here is becoming interlaced with traction lines.

Quite a number of our brothers have received employment on both sides of the engine. Our membership is on the increase and about all we need now to complete having an A No. 1 lodge in all particulars is to organize a Ladies Society. We need one here and need it badly. Can't some one tell our worthy sister, Editress A. G. Strong, and see if that great big society (Hazel) over in Peoria, can't come over here (only forty miles) and help us organize a Ladies Society?

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LODGE 529—(*Member, Mena, Ark.*) Conditions here are good and we have a very nice job. Taking it all in all, our organization on this system is in fine shape and is steadily growing—thanks to our officers, who are hustlers when it comes to looking after the interest of the fire boys.

In our through freight service we have big engines, but are getting a fair grade of coal at present.

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LODGE 492—(*J. R. Sowell, Smithville, Texas.*) We are having the trying time of our lives just now. For instance, the young runner just promoted is called out on any old run. Well, he goes to his engine to find a student fireman. Things look blue to him, with hardly time enough to oil around. He assists the fireboy in getting the engine ready. Up steps some one and says, "Well, Bill, how are you fixed?" It is a "boomer" brakeman. They start for the yard. Then who stops him but an old-time friend who has just been promoted to conductor—then his joy is complete, and if life doesn't seem like a failure then I don't know what does. We also have the old fireman who four months ago was enjoying the pleasure of a regular run with plenty of good coal; but, alas, 'tis all of the past. However, in all this broad land you could not find a better class of brothers than we have here in old 492. We have a large harvest which will soon begin to ripen, while our goat is in fine shape. We hope all the boys will get in line and let our goal be to gather in all the unprotected, so that they can stand before the world and say, "I belong to the grandest old order in the world today, the B. of L. F. and E." Work hard, brothers, to swell our ranks, so that we can all feel that we have done our duty. Boys, you know there is room for improvement in our lodge, so get busy.

LODGE 7—(*John M. Hall, Washington, D. C.*) Potomac Lodge desires, through the columns of our most valuable Magazine, to extend to every sister lodge and each one of our members its heartfelt wishes for a happy and prosperous New Year, and to express the hope that our grand Order will bloom out and increase in prosperity and numbers, and that every brother will be brought to a better understanding of the fact that he is a stockholder and that we are all partners in this great and honorable order of ours, and that our organization will be just as we make it. That is what I charged all the candidates I initiated when I was Master of No. 7. I also tried to impress it on them that we wanted them to be better employes, if possible, than they had been before they became members, and that the Brotherhood would not help anyone or any cause that was not just and proper, but that if they thought they had been unjustly dealt with we would do everything in our power to assist them, and I am sure that there are thousands of men today who can testify to that fact.

Well, my brothers, Potomac Lodge is not doing business at the old stand, as we have moved to an up-to-date hall, and it is a fine one—plenty of room to give the goat full swing, and then some more. Our new hall is located on the corner of 3d and Pa. Ave. S. E. It has plenty of large arm chairs, and is nicely lighted and I think that the attendance at our meetings will be greatly increased. Our meeting nights are the same, the 2d and 4th Wednesday nights at 8 p. m., and we have added the first Sunday afternoon meeting of each month at 2 o'clock p. m., which will give the night boys a chance to show up. Brothers who come this way will always find a hearty welcome to Potomac Lodge awaiting them. We have a good set of officers and I am glad to say that with two exceptions they all attend meetings regularly.

Brothers, I remember that a request for a donation was received by Potomac Lodge last meeting from our Grand Secretary and Treasurer, to build a monument to our Past Grand Counsellor, Brother Murphy, and I am proud to say this lodge made the donation as readily as she always does to help any worthy cause.

Another worthy brother whose memory should be honored by the erection of a monument is Past Grand Master F. P. Sargent, and I trust a movement in this direction will soon be started. The B. of L. F. numbered about fourteen thousand members when Brother Sargent was elected Grand Master in Philadelphia in 1885, and when he resigned (a thing that he always regretted) to take a Federal position, our membership was over fifty thousand, and I tell you, my brothers, that we should get together and have a substantial memorial erected to his memory.

My brothers, there is one more point I want to touch on, and that is the vast number of nonbrotherhood men firing engines in the country today. I was told recently that out of our sixty-eight thousand members in the B. of L. F. and E. only about thirty-two thousand are actually firemen. Now, brothers, when you realize that there are some ninety thousand locomotive firemen you will perceive that we are letting a lot of fellows enjoy the advantages of our organized efforts who contribute nothing either in energy or finance to the work of securing those advantages. In my opinion a man in the railroad service who does not belong to the order that represents his calling has a yellow streak in him, and there is something wrong with him somewhere. The insurance feature is alone incentive enough for any sane man who is eligible to join our order, for I know that the insurance department of our Brotherhood has advantages not to be found in any other insurance, and a married man or a man who has a mother or other relatives depending on him, is not a man in the true sense of the word if he does not provide for them, in case something happens to him. I can testify personally to the benefits of our insurance, as I have lost my left foot and I was off duty for eleven months, having at the time been married only six months, and, my friends, do you realize that the $1,500 I received from the order made me as independent as anybody? and I did not or have I ever asked anybody for a favor or a cent, but the way the members of my lodge kept inquiring after me I was satisfied that they would have done anything for me that was necessary.

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LODGE 407—(*Member, Seattle, Wash.*) We are still doing business and prospering all the time, being a pretty live bunch of boys, always there when there is something doing. We are all working at the present time. Business is better than at this time last year and the prospects are good that it will continue. We are looking forward to meeting a great many of our brothers this coming year during the Alaska-Yukon-Pacific Exposition. Everything is being done to give everybody who may come a grand reception. Our lodge wishes every one of the members of the B. of L. F. and E. a prosperous year during 1909.

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LODGE 391—(*Member, Ft. Madison, Iowa.*) We are still doing business at the old stand, and are keeping our goat busy, having from one to five new members at every meeting to enjoy his antics, and we have enough applications on file to keep us busy for several meetings to come. Business is picking up on the A., T. & S. F. We managed during the hard times without cutting the extra board, although some of the regular men stayed right with their engines and did not lay off a trip, and it kept the extra men guessing how to make both ends meet on one trip a week. Our engines are compound; we have good coal and the very best of officials, and Mr. Dinan, our master mechanic, cannot be excelled.

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LODGE 538—(*H. C. Wickliffe, South Chicago, Ill.*) As dear old Gladstone Lodge 538 was heard from last month, it may seem a little too soon to be heard from again in the February issue of the Magazine. Yet, as we have been very quiet for the past decade, I believe we are excusable, for the simple reason that the reaction which this lodge has received recently has been something phenomenal. Members of Triumphant Lodge 47 visit our lodge at every meeting, and we return the visits with interest.

We have Bro. A. P. Kelley with us once in a while, and he certainly makes things interesting. We initiated one candidate last meeting, and we have about six or eight candidates who have been elected for membership. Our meetings are very well attended, averaging about twenty-five, which is very good considering the fact that most of the members are located at Gary, Ind., about nineteen miles from the hall, and have very poor transportation facilities late at night.

One of our new brothers was quite seriously injured recently while out on the road, the injury being received in a very peculiar way. While at Momence, Ill., Brother Dougherty had something to do which brought him in close contact with the engine brake cylinder. It seems that the brake was set, and he was leaning over the piston, with his body between the brake cylinder and the brake lever, and while in this position the brake was released and the spring in the cylinder was so strong that it drew the lever back and crushed Brother Dougherty between the brake cylinder head and the lever. He had several ribs broken, besides other injuries, but is doing quite well, I am pleased to say. Business is very dull, but I believe we have a bright outlook ahead. I wish all the brothers health, happiness and prosperity during the New Year.

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LODGE 442—(*Member, Allandale, Ont.*) As I have been a member of Barrie Bay Lodge 442 for a little over two years and have not seen any correspondence from our little lodge during that time, I thought it my duty to let our outside brothers know that there is such a lodge as Barrie Bay. We are still doing business at the same old stand and taking in a couple of new members every meeting, and there are still quite a number yet that we expect to take into the fold.

The business depression for the last six months has been keenly felt by us all. There has been twelve brothers set back firing, but as business looks now it will not be long before they will occupy the right side of the cab again. We have a nice little local here—about 75 members, but sometimes it is quite an undertaking to get enough together to hold a good, lively meeting. However, our members are beginning to see the usefulness of holding good meetings and are turning out in larger numbers.

Our engines are in very good shape at present, the most of our power being the Richmond compound, and good steamers. When we get a load of finecut on our tenders there is something doing, especially when the nuggets begin to accumulate on the grate bars. We have a good staff of officials to work under, and everything seems to be going on as well as can be expected under the present business conditions.

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LODGE 97—(*Nathan Gunnels, Beaumont, Cal.*) At 3:18 on the morning of December 12th last, the citizens of Beaumont were awakened by one of the most terrific explosions that was ever heard in this city. Engine No. 2,769, which was pulling an extra freight east, had met another freight train at this station. Upon starting out and after going about ten car lengths the boiler of engine 2,769 exploded, killing Engineer D. P. McDonald, Fireman Roy Reynolds, of Lodge 97, B. of L. F. and E., Conductor Guy H. Brockman, and seriously injuring Brakeman E. A. Williams, he being on the pilot of the engine at the time of the explosion. The boiler was blown a distance of 400 feet ahead, over the tops of the cars standing on the main line. Engine 2,769 had been standing on a siding with helper next to caboose, when they started to pull out of the city. The bodies of those who were killed were found under the tender of the engine on the right side, while Brakeman Williams was found wandering around in the dark, dazed. The cab was blown back about 200 feet, striking the tender of engine 2,557, which was leaving the roundhouse. The explosion was heard at Banning, six miles away, and broken windows in many near-by houses told of its force.

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LODGE 188—(*L. E. Winslow, Chicago, Ill.*) We are running along in the same old way. Most of our spare time has been put in in trying to get prospectives or those eligible to membership to join our ranks, but we have not met with very good success. We deemed it advisable, therefore, to write each of those eligible to membership a letter and show him in as few words as possible the advantages of joining our ranks.

Our letter to them was as follows:

"We take the liberty to enclose an application for the B. of L. F. and E., thinking it about time you handed one in. The time is fast drawing near when the Board of Adjustment will convene, and you cannot expect to reap any of the benefits or have voice in the settlement or adjustment of our working conditions unless you are represented.

"We sincerely hope that you have thought of this matter before and will not delay in placing yourself among us.

"There are a few things we wish to call your attention to: First, that the B. of L. F. and E. is one of the strongest and best labor organizations in the world; second, united we stand, divided means oppression in our working conditions; third, the insurance is the best and cheapest railroad insurance you can get; fourth, you may get into a little trouble and our assistance is a nice thing to have in a good many instances; fifth, we have ever the social, moral, intellectual and general welfare of our members in mind; sixth, we consider there is no excuse for you in not becoming a member. The cost is small and if your excuse is that you cannot pass medical examination you can become a social member, of which we have quite a few, their dues being of little consequence; seventh; we have a nice Ladies Society in connection with our lodge, which your mother, wife or sister can join, and also have a very cheap insurance; last but not least, there is a monthly Magazine which you will receive, and if you read it carefully, when the time comes for promotion you will pass a first-class examination.

"You may have other excuses, but we hope not, so let us hear from you at an early date." (Signed)

OFFICERS AND MEMBERS OF
No. 188, B. of L. F. and E.

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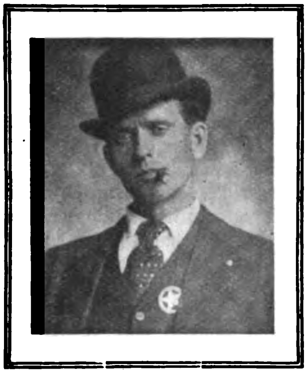
LODGE 172—(*H. E. White, Ottawa, Canada.*) We are doing business at the same old stand, but not quite in the same old way. We are progressing, notwithstanding the depression in business and that a number of our boys are out of work. We are expecting business to pick up in a month or two, and as we have our eye on a number of the boys who are only waiting for a little cash to enable them to join one of the grandest orders of the day, we also expect our lodge to prosper. I am sorry to state we have recently lost one of our best members, Bro. J. D. Sweet, who was killed while on duty on November 23d last, at Sand Banks. We are following the constitution very closely in the matter of payment of dues. Our Financial Secretary is very strict and lets the boys know that business can't be done without the money. We are retaining our engineer members all right. Our officials have been very generous towards us in the past, especially our superintendent, Mr. H. B. Spencer, who always comes to our assistance in time of trouble and is willing to do all in his power for us. We appreciate his kindness very much. I close, wishing the B. of L. F. and E. and all of its members, as well as the members of the Ladies Society, a prosperous new year.

Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge requesting that a notice be published in the Magazine inquiring for such address or other information same will be complied with. However, the Magazine can not undertake the office of a collecting agency and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice.

J. E. Benson.—Was formerly located at Milan, Mo. Has not been heard from for almost two years. Any one knowing his whereabouts will please correspond with Mrs. J. E. Benson (his wife), Moulton, Iowa.



J. E. BENSON

Grant Martin.—Formerly fired on the Eastern Iowa division of the C., R. I. & P. R. R. Was not at that time a member of the Brotherhood. Any one knowing his whereabouts will please correspond with Albert L. Nye, Room 406 Utica Bldg., Des Moines, Iowa.

John Brier.—Was a member of Silver Mountain Lodge 327, B. of L. F. and E., last heard from he was in Sacramento, Cal. His wife, who is in very poor circumstances, would be very glad to receive any information concerning him, as she is anxious to locate his whereabouts. Any one knowing anything concerning him will please correspond with G. A. Conant, Needles, Cal.

Arthur H. McIntyre.—Was last heard of at Seattle, Wash. Was a member of Lodge 596, B. of L. F. and E. Is about six feet tall, has dark hair and eyes. Any one knowing his whereabouts will confer a favor by communicating with F. A. Pinkston, Secretary-Treasurer Lodge 596, B. of L. F. and E., 2299 Gerrard street, East Toronto, Ont.

Bert Steele.—When last heard of was firing an engine on the Southern Pacific out of Ogden, Utah. Any one knowing his whereabouts will confer a favor on his mother by corresponding with F. E. Patton, 543 E. College street, Jackson, Tenn.

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Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Receipt for quarter ending March 31, 1909, also receipt for quarter ending June 30, 1909, belonging to L. M. Keith, member of Lodge 539, B. of L. F. and E., were lost recently in Kansas City. If found please take up and return to L. M. Keith, General Delivery, Hibbing, Minn.

Receipts belonging to E. W. Jett and C. D. Mauk, both members of Lodge 444, B. of L. F. and E., for quarter ending March 31, 1909, were recently lost or stolen. If presented please take up and send to A. D. Whittle, Recording Secretary Lodge 444, 1611 Van street, Knoxville, Tenn.

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Acknowledgments.

Mrs. Mary Moyes, St. Louis, Mo., desires to thank the Brotherhood for the kindness shown her during her sad bereavement in the death of her son, William E. Simmons, of Lodge 667. She also wishes to especially thank Lodges Nos. 6, 390 and 667.

Bro. John J. Wells, of Lodge 195, wishes to thank the officers and members of that lodge, as well as the delegates to the Eleventh Biennial Convention, for their help in getting his insurance on account of his disability. He also wishes to thank the Grand Lodge and the Brotherhood in general for the prompt payment of same.

Mrs. Lillian Werno Ruland, of Chicago, Ill., wishes to express her heartfelt appreciation of the many kind words of condolence expressed as well as the kindness in many ways shown her during the sickness and death of her husband, Bro. Fred Oscar Ruland, of Lodge 275. She also wishes to thank the Brotherhood for the prompt payment of claim. It is her sincere wish that the B. of L. F. and E. may continue to prosper and that its members shall be spared to live long lives.

Mrs. Arthur L. Haneline, of Fort Wayne, Ind., wishes to thank the B. of L. F. and E. for the prompt payment of claim of her late husband, Bro. Arthur L. Haneline, of Lodge 141, B. of L. F. and E., who recently died of injuries received in a wreck. She also desires to thank the members of Lodge 141 for their kindness to her in her sad bereavement and for the beautiful floral offering they sent.

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The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of December, 1908:

B. of L. F. and E. Lodges 6, $5; 9, $25; 23, $50; 35, $5; 88, $5; 101, $20; 115, $2; 166, $5; 167, $10; 175, $12; 194, $17.50; 242, $5; 265, $5; 272, $12; 290, $10; 313, $5; 333, $5; 355, $5; 370, $5; 416, $1; 532, $5; 558, $2; 566, $5; 591, $5; 617, $10; 649, $5; 654, $10; 660, $5	$207 00
L. S. to B. of L. F. and E. Lodges 19, $2; 30, $5; 35, $5; 59, $2; 101, $2; 141, $3; 148, $3; 207, $5	27 00
O. R. C. Divisions	259 31
B. of R. T. Lodges	758 75
B. of L. E. Divisions	504 70
L. A. C. Divisions	126 50
L. A. T. Lodges	186 25
G. I. A. Divisions	224 95
C. & N. W. conductors' room, Wells-street Depot	3 40
James Walker, Lodge 788, B. of R. T.	5 00
Geo. F. LaChance, Division 10, B. of L. E	1 50
J. M. Brickhouse, Little Rock, Ark.	2 00
Proceeds of entertainment given by Lodge 529, B. of R. T.	145 00
Proceeds of excursion given by Chicago lodges and divisions August 16th	63 50
Receipts from individuals amounting to $1 each	18 00
Total	$2,544 91

Miscellaneous.—One box of canned goods from Division 50, L. A. T.; one quilt from Division 382, G. I. A.; two quilts from Division 367, L. A. T.; one box of canned goods from Division 128, L. A. T.; one quilt from Division 149, G. I. A.; box of cigars from A. E. King, Cleveland, Ohio; box of cigars from W. C. Hately, Highland Park, Ill.; two boxes of cigars and two gallons of home-made wine from the C. & N. W. Ry. conductors, brakemen, engineers and firemen; two boxes of cigars from M. J. C. Condon, No. 83, O. R. C., and one quilt from Lodge 152, L. S.

Respectfully submitted,
JOHN O'KEEFE,
Sec. and Treas. R. R. M. H.

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER.
PEORIA, ILL., January 1, 1909.

TO SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of December 1908:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1		77	4 50	153		229		305		381		457		533		609		685	
2		78		154		230		306		382	9 00	458		534	3 00	610		686	
3	4 50	79		155		231		307		383		459	2 25	535	1 50	611		687	
4		80	123 75	156		232		308		384		460	104 25	536		612		688	
5		81	4 50	157	84 75	233		309	8 00	385		461		537		613		689	
6		82		158		234		310		386		462		538		614		690	
7		83	1 50	159		235		311	13 50	387	134 00	463		539		615		691	
8		84		160		236		312		388		464		540		616		692	
9		85		161		237		313		389		465		541		617		693	23 25
10		86	10 50	162	1 50	238		314	3 00	390		466		542		618		694	
11		87		163		239		315		391		467		543		619		695	
12		88		164		240		316		392		468		544		620		696	
13		89		165		241		317		393		469		545		621		697	28 50
14		90		166		242		318		394		470		546		622		698	
15		91		167	164 50	243		319		395		471		547		623		699	
16		92		168		244		320		396		472		548		624		700	43 50
17		93	9 00	169		245	145 50	321		397		473		549		625		701	
18		94		170	4 50	246		322		398		474	139 50	550		626	132 75	702	
19		95		171		247		323		399		475		551	4 50	627		703	
20		96		172		248		324		400		476		552		628		704	1 50
21	6 75	97		173		249		325		401		477		553		629		705	
22		98		174		250		326		402		478	157 50	554		630		706	
23		99		175	4 50	251		327	4 50	403		479		555		631		707	
24		100		176		252		328	22 50	404		480		556		632		708	
25		101	3 75	177		253		329		405		481		557		633		709	
26		102		178		254		330		406		482		558	3 75	634		710	
27		103		179		255	96 50	331	6 75	407		483		559	2 25	635		711	
28	5 25	104		180		256		332		408		484		560		636		712	
29		105	9 00	181		257		333		409		485		561		637		713	
30		106		182	400 50	258		334		410		486	4 50	562		638	154 00	714	8 25
31	75	107		183		259		335		411		487		563		639	4 50	715	
32		108		184		260		336		412		488		564		640	55 00	716	
33		109		185		261		337		413		489	167 25	565		641		717	
34	2 25	110		186		262		338		414		490		566		642		718	
35		111		187		263		339		415		491		567		643	52 75	719	
36		112	1 50	188		264		340		416		492		568		644		720	
37		113		189		265		341		417		493		569		645		721	
38	4 50	114		190		266		342		418	6 75	494		570		646		722	
39		115		191		267		343		419		495	73 25	571		647	4 50	723	
40	6 75	116	115 25	192		268		344		420	6 00	496		572		648		724	62 50
41		117		193		269	142 50	345		421		497		573		649		725	
42	53 25	118		194	4 50	270		346		422		298		574		650		726	
43	4 50	119		195		271		347		423		499		575		651		727	
44		120	1 50	196		272		348		424		500		576		652		728	81 00
45	4 50	121		197		273		349		425		501	1 50	577		653		729	
46		122	57 25	198		274		350		426		502		578		654		730	
47		123		199		275		351		427		503		579		655		731	
48		124		200		276		352		428		504		580		656		732	
49		125	48 75	201		277		353		429		505		581		657	3 00	733	
50		126		202		278		354	20 25	430		506		582		658		734	
51	4 50	127	6 75	203		279		355		431		507		583		659		735	
52		128		204		280		356		432		508		584		660		736	
53		129	4 00	205		281		357		433		509		585		661		737	
54		130		206	4 50	282		358		434	4 50	510		586		662		738	
55		131		207		283		359		435		511		587	199 00	663		739	
56		132		208	74 25	284		360		436		512		588		664	94 75	740	
57	1 50	133		209		285	366 00	361		437		513		589		665		741	
58		134		210		286		362		438		514		590	168 50	666	286 50	742	
59	4 00	135		211		287		363		439	16 50	515		591	6 75	667		743	
60	6 75	136		212		288		364		440		516		592		668		744	
61	1 50	137		213		289		365		441		517		593		669		745	
62		138		214		290		366	89 25	442		518		594		670		746	
63	257 00	139		215		291		367	2 25	443		519		595		671		747	75
64	1 50	140		216		292		368		444	3 75	520		596		672		748	
65		141		217		293		369		445	246 00	521		597		673		749	
66		142		218		294		370		446	16 50	522		598	6 00	674		750	
67		143	437 50	219		295		371		447		523		599		675	168 00	751	
68		144		220		296		372		448		524		600		676		752	
69		145	2 25	221		297		373		449		525		601		677		753	
70	4 50	146		222		298		374		450		526		602	219 50	678		754	
71		147		223		299		375		451		527	4 50	603		679	4 50	755	
72		148		224		300		376		452		528		604		680		756	
73		149	2 25	225		301		377		453		529		605		681		757	74 50
74		150		226		302		378		454		530		606		682		758	
75		151		227	102 50	303		379		455		531		607		683		759	
76		152		228		304		380		456	156 25	532		608		684		760	

Received during month of December $6,136.75

Respectfully submitted, W. S. CARTER, G. S. and T.

Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM NOVEMBER 30, 1908, TO DECEMBER 31, 1908.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
647	J. M. Capehart	325	Disability	Nov. 16, 1908	$1,500	Paralysis and locomotor **ataxia.**
1366	James Gallagher	92	“	“ 11, “	1,500	Paralysis.
1388	John Moriarty	92	“	“ 10, “	1,500	Paralysis.
1390	William Quealy	140	Death.....	Sept.10, “	1,500	Collision.
1403	John V. Kennedy	94	“	Oct. 1, “	1,500	Crushed between cars.
2090	Morris Griffin	44	Disability	“ 31, “	1,500	Paralysis.
384	Frank Foley	227	“	Nov. 10, “	1,500	Consumption of lungs.
1192	Ben Thomas	173	Death	June 28, “	1,500	Derailing of engine.
1371	Vincent A. J. Baer	302	“	Sept.10, “	1,500	Typhoid fever.
1212	John McSorley	4	“	July 16, “	1,500	Falling from engine.
1413	Fred C. Ryan	117	“	Oct. 8, “	1,500	Collision.
1414	Thomas F. McCartney	348	“	Sept.10, “	1,500	Inflammation of liver.
1415	Samuel E. Clark	416	“	Oct. 11, “	1,500	Typhoid fever.
1416	D. L. Wilson	402	“	“ 11, “	1,500	Peritonitis.
1417	John Demarchi	200	“	Sept.17, “	1,500	Typhoid fever.
1418	Willis Jarvis	262	“	Oct. 16, “	1,500	Collision.
1419	H. A. Trunkey	683	“	“ 9, “	1,000	Typhoid fever.
1420	Arthur E. Lee	611	“	“ 15, “	1,500	Derailing of engine.
1422	Jacob Frank	196	“	“ 21, “	500	Bright's disease.
1423	Elmer Stowman	264	“	“ 3, “	1,500	Hemorrhage of bowels.
1427	Peter McDonough	62	“	“ 7, “	1,500	Bright's disease.
1428	Thomas Leahy	283	“	“ 23, “	1,500	Pneumonia.
1429	William D. Reid	253	“	“ 18, “	1,500	Falling from engine.
1430	William H. Bates	702	“	Sept.14, “	1,500	Falling from porch.
1431	Henry Duncan	182	“	“ 23, “	1,500	Typhoid fever.
1432	William D. Ramspeck	93	“	Oct. 7, “	1,000	Derailng of engine.
1433	Geo. A. Summerville.	363	“	“ 29, “	1,500	Boiler explosion.
1434	Harry R. Albertson	250	Disability	Nov. 12, “	1,500	Locomotor ataxia.
1437	John W. Hogan	511	Death	Oct. 27, “	1,500	Cancer.
1440	Eugene Bennett	344	“	Sept.25, “	1,500	Head-on collision.
1441	Walter J. Bentley	313	“	Nov. 5, “	1,500	Tonsilitis.
1443	Richard L. Hoffman	101	“	“ 4, “	1,500	Struck by **train.**
1444	William Nauyok	280	“	Oct. 27, “	1,500	Overdose of morphine.
1446	Franklin J. Armstrong	169	“	Nov. 7, “	1,500	Struck by train.
1448	George D. Peet	71	Disability	“ 21, “	1,500	Consumption of lungs.
1449	Fred O. Ruland	275	Death.....	“ 4, “	1,000	Fracture of skull; **cause unknown.**
1450	Raymond Harrison	270	“	“ 3, “	1,500	Apoplexy.
1451	John Middagh	260	“	“ 9, “	1,500	Gunshot wound.
1452	John L. Murphy	355	“	“ 8, “	1,500	Bright's disease.
1453	Burleigh C. McGuire	566	“	“ 9, “	1,500	Crushed between **engine and car.**
1447	Emil Barquist	519	Disability	“ 6, “	1,500	Amputation of foot.

Death Claims Paid.

29—A	**$43,500.00**
3—B	**3,000.00**
1—C	**500.00**
33	**$47,000.00**

Disability Claims Paid.

8—A	**$12,000**
8	**$12,000**

41 death and disability claims paid, aggregating $59,000.00

Pending Claims December 31, 1908.

65 death claims aggregating	**$86,500**
22 disability claims aggregating	**29,000**
Total of 87 claims aggregating	**$115,500**

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Statement of Death and Disability Claims

FILED WITH THE GENERAL SECRETARY AND TREASURER DURING THE MONTH ENDING JANUARY 15, 1909.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
1511	Henry C. West	409	Dec. 16, 1908	Disability	Amputation of fingers	$1,500
1512	John F. Smith	581	" 16, "	"	Appendicitis	1,500
1513	Albert Milhollin	236	" 16, "	"	Leg broken in knee and ankle	1,500
1514	Patty Londress	395	" 16, "	"	Paralysis	1,000
1515	Arthur Alt	412	" 16, "	Death	Head-on collision	1,500
1516	Henry C. Brock	569	" 16, "	"	Boiler explosion	2,000
1517	Wm. B. Taylor	6	" 17, "	Disability	Consumption of lungs	1,000
1518	Robert W. Ewing	490	" 18, "	"	Locomotor ataxia	1,500
1519	Louis M. Cramer	48	" 18, "	"	Consumption of lungs	1,000
1520	Cornelius G. Daly	441	" 19, "	Death	Pulmonary tuberculosis	1,500
1521	James E. Carter	168	" 19, "	"	Rear-end collision	500
1522	Elmer R. Noble	225	" 19, "	"	Collision	1,000
1523	Edgar McKeough	520	" 21, "	Disability	Consumption of lungs	500
1524	Alonzo T. Baughman	552	" 21, "	Death	Derailing of engine	1,500
1525	A. B. McCreery	421	" 22, "	Disability	Blind in one eye	1,500
1526	Roy Reynolds	97	" 22, "	Death	Boiler explosion	1,500
1527	Walter A. Osterhout	232	" 22, "	"	Abscess of brain	1,500
1528	Robert A. Ritzey	211	" 23, "	Disability	Bright's disease of kidneys	1,500
1529	Jacob Huber	251	" 24, "	"	Injury to back and spine	1,500
1530	William Lewis	535	" 26, "	"	Amputation of foot	2,000
1531	George E. Sidell	434	" 26, "	Death	Struck by car	1,500
1532	W. T. Kane	36	" 28, "	"	Pyelitis	1,500
1533	Alma A. Peterson	19	" 28, "	"	Typhoid fever	1,500
1534	Ernest A. Flude	127	" 29, "	Disability	Amputation of foot	500
1535	Leonard B. Baker	43	" 29, "	"	Cancer of gall bladder	1,500
1536	James E. Eldridge	284	" 30, "	"	Blind in one eye	1,500
1537	Ernest W. Burk	444	" 30, "	Death	Consumption	1,500
1538	Edward T. Hand	189	" 30, "	Disability	Impaired vision	1,000
1539	Harry N. Gilbert	285	" 30, "	Death	Typhoid fever and meningitis	1,500
1540	Wm. F. Crittenden	59	" 30. "	Disability	Valvular disease of the heart	1,500
1541	Earl Reynolds	231	" 31, "	Death	Scarlet fever	1,500
1542	Joseph E. Gahagan	71	" 31, "	"	Pneumonia	1,500
1543	Frank McGurk	8	" 31, "	Disability	Hernia	1,500
1544	Silous W. Dixon	8	" 31, "	"	Pericarditis and indigestion	1,500
1	Wm. E. Simmons	667	Jan. 4, 1909	Death	Collision	1,500
2	Chas. Geiler	409	" 4, "	Disability	Amputation of foot	1,500
3	Jeremiah Canty	334	" 4, "	"	Blind in one eye	1,500
4	Roy Renshaw	198	" 4, "	Death	Typhoid fever	1,500
5	Walter R. Worden	5	" 4, "	Disability	Locomotor ataxia	1,500
6	Richard Durant	498	" 4. "	"	Amputation of hand	1,500
7	R. L. Maxwell	54	" 5, "	"	Injured limb	1,000
8	Chas. F. Simpson	274	" 5, "	"	Dislocated hip	1,000
9	John M. Whittington	602	" 5, "	Death	Peritonitis	1,000
10	Hugh B. Fontaine	726	" 5, "	Disability	Consumption of lungs	1,500
11	Wm. C. Shollenberger	552	" 5, "	"	Blind in one eye and heart disease	1,500
12	J. H. Werdine	539	" 5, "	"	Tuberculosis of knee joint	1,500
13	Albert R. McGrew	646	" 5, "	"	Partial amputation of hand	1,500
14	Geo. A. Hepting	159	" 5, "	Death	Run over by engine	1,500
15	Robert A. Ritzey	211	" 6, "	"	Bright's disease	1,500
16	Henry Wells	457	" 6, "	"	Collision	1,500
17	William A. Loos	141	" 7, "	"	Typhoid fever	1,500
18	William Leslie	287	" 7, "	Disability	Amputation of fingers	1,500
19	Frank H. Marshall	485	" 7, "	Death	Knife wound	1,500
20	Geo. H. Ritchey	262	" 7, "	Disability	Locomotor ataxia	1,500
21	Benjamin Reed	404	" 7, "	"	Loss of one eye	1,500
22	E. B. Bonfoey	237	" 8, "	Death	Bright's disease	1,500
23	Jas. J. Hogan	208	" 8, "	Disability	Leukemia	1,500
24	J. L. Haggin	330	" 9, "	"	Injury to hand	1,500
25	Robt. Brooks	2	" 11, "	"	Erythema	1,500
26	H. E. Cathcart	225	" 11, "	"	Blind in one eye	1,500
27	F. A. Simpson	325	" 11, "	"	Injury to hand	1,500
28	Frank L. Baird	552	" 11, "	"	Impaired vision	1,500
29	Herman B. Banister	317	" 11, "	"	Amputation of foot	1,500
30	William Fagans	72	" 12, "	Death		1,500
31	Walter E. Smith	91	" 12, "	Disability	Injury to spine and back	1,500
32	Hubert Hall	470	" 13, "	"	Bright's disease	1,500
33	Walter W. Allison	75	" 13, "	Death	Heart failure	1,500
34	Herbert P. Ransom	409	" 13, "	"	Run over by train	1,500
35	C. E. Peterson	407	" 13, "	"	Melano sarcoma	1,500
36	William J. Remley	202	" 14, "	"	Collision	1,500
37	Gustav J. Klineyoung	673	" 14, "	"	Striking bridge	1,500
38	Thomas F. Gallagher	73	" 14, "	"	Pneumonia	1,500
39	Harry F. Shultz	214	" 14, "	"	Run over by train	1,500
40	Burt W. Lundgren	34	" 15, "	Disability	Diabetis	1,500
41	Wm. B. Whaley	249	" 15, "	"	Amputation of hand	1,500
42	Henry J. Carter	314	" 15, "	Death	Pneumonia	1,500

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Statement of Benevolent Claims.

PAID BY THE GRAND SECRETARY AND TREASURER, FROM DECEMBER 1st, 1908, TO DECEMBER 31st, 1908.

Claim No.	NAMES.	Lodge No.	Amount Carried.	Amount Paid.
2191	Lafa Applegate	413	$1,500	$1,500
762	Florence C. Butts	202	1,500	1,500
2068	William T. Boeshore	562	1,500	1,500
40	Joseph P. Lewis	236	1,500	500
221	W. H. Trickey	175	1,500	1,500
296	Pat. McGarrigal	238	1,500	500
308	Charles L. Spain	439	1,500	500
326	Otto Olson	237	1,500	1,500
438	James G. Culbertson	198	3,000	1,500
475	John J. Wells	195	1,500	1,000
571	Alfred C. Saults	38	1,000	1,000
598	Charles Hilms	149	1,500	1,500
2092	Nels Olson	426	3,000	3,000
120	Charles R. Gardner	113	1,500	1,500
547	William L. Walker	309	750	750

15 claims paid aggregating $19,250.00.

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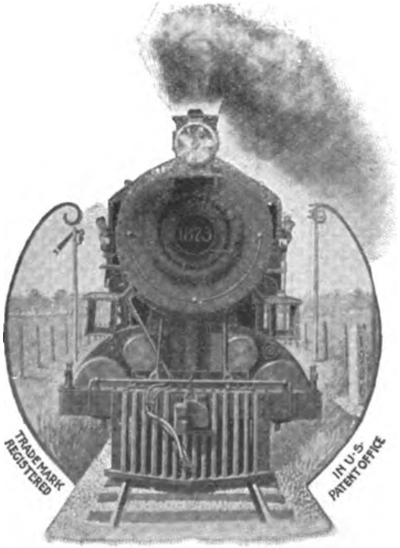

General Fund Assessment Notice No. 3.

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., February 1, 1909.

To Officers and Members of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified that the sum of twenty-five cents ($0.25) General Fund Assessment No. 3 is now payable, and must be paid to the Financial Secretary of your Lodge on or before March 1, 1909, by every member on rolls February 28th, 1909.

Any member failing or refusing to make payment of the foregoing assessment will stand expelled, said expulsion taking effect March 2d. Financial Secretaries are required to deliver their returns for General Fund Assessment, together with the proper statements, to the Treasurers of their Lodges not later than March 5th, and Treasurers are required to forward the same so as to reach the Grand Lodge not later than March 20th, as provided in Section 165 of the Constitution.

All members, including honorary and non-beneficiary members, are hereby notified that they are liable for the payment of General Fund Assessments.

Yours fraternally,

W. S. CARTER, President. A. H. HAWLEY, G. S. and T.

(NOTE.—General Fund Assessments, of 25 cents per month, take the place of Grand Dues. Therefore, no more Grand Dues will be collected. Members who have already paid the 75 cents General Fund Assessment previous to January 1st will not be required to pay other General Fund Assessments until the assessment collected on or before April 1, 1909.)

Beneficiary Assessment Notice No. 18.

SERIES H.

GRAND LODGE, B. OF L. F. & E.
PEORIA, ILL., February 1, 1909.

To the Treasurers of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified that assessments for death and disability claims are hereby levied as follows: For each beneficiary member whose name appears on the rolls of membership on January 31, 1909 (also for all beneficiary members transferred from your Lodge after January 1), carrying a Beneficiary Certificate of THREE THOUSAND ($3,000) DOLLARS, you are required to forward the sum of SIX DOLLARS ($6.00). For those carrying a Certificate of Two THOUSAND ($2,000) DOLLARS, you are required to forward the sum of FOUR DOLLARS ($4.00). For those carrying a Certificate of FIFTEEN HUNDRED ($1,500) DOLLARS, you are required to forward the sum of TWO DOLLARS AND TWENTY-FIVE ($2.25) CENTS. For those carrying a Certificate of ONE THOUSAND ($1,000) DOLLARS, you are required to forward the sum of ONE DOLLAR AND FIFTY ($1.50) CENTS, and for each member carrying a Certificate of FIVE HUNDRED ($500) DOLLARS, you are required to forward the sum of SEVENTY-FIVE ($0.75) CENTS. You are hereby requested to make remittance for assessment No. 18 as soon as possible, and in no event to reach the Grand Lodge later than February 20, 1909, as provided in Section 82 of the Constitution.

Yours fraternally,

W. S. CARTER,
President.

A. H. HAWLEY,
G. S. and T.

SPECIAL NOTICE.—All remittances must be made by BANK DRAFT, MONEY ORDER, OR EXPRESS ORDER. Beneficiary members whose applications were approved after January 1 are not liable for this assessment.

Let Your Soul Feed on the Flowers

BY ADELBERT CLARK.

Let your soul feed on the flowers
  When the morn has just begun;
They will strengthen, cheer and comfort,
  Ere the day of strife is done.
Whether they are waxen lilies,
  Or are violets of blue,
You will find in them your heaven—
  All that's pure, and good, and true.

Let your soul feed on the flowers
  From each golden sun to sun;
Fill your empty soul, my brother,
  Ere the course of Life is run.
O, how often we poor mortals
  Starve the precious hungry soul
In our eagerness to capture
  Wealth and Fame, man's highest goal!

Let your soul feed on the flowers
  As you journey day by day,
And you'll find that Heaven's portals
  Are not very far away;
You will find in every blossom
  Purity, and Love, and Grace,
And if you examine closely,
  You will see the Master's face.

Let your soul feed on the flowers
  That the sunbeams love to kiss;
When you drink the dregs of Sorrow,
  They will fill your soul with bliss.
Let the mocking, gay deceivers
  Scourge you on their way to Fame!
You shall pass them at the Portals—
  God will scourge them with their shame.

Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa.

Matters for the Grand President should be addressed to Mrs. Georgie M. Sargent, 2815 Fourteenth street, N. W., Washington, D. C., and that for the Grand Secretary and Treasurer to Mrs. Mary E. DuBois, 1603 First street, Boone, Iowa.

* * *

Grandmother's Valentine

Away in a tiny cedar chest
In grandmother's room, among the rest
Of things, that grandmother loves the best,
Is an old-fashioned valentine.

Its face has faded, and lips that told
Of a love to last 'til hearts grew cold
Are dimmed, where grandmother's tears of old
Marred that old-fashioned valentine.

Yet, dainty still in its sweet decay
In grandmother's chest, folded away
With memories dear, of another day,
Is that old-fashioned valentine.

And grandmother marks each passing year
By a peep at the token cherished dear,
And locks in the cedar chest the tear,
And that old-fashioned valentine.

—IMOGENE BATES.

Mount Vernon Lodge 202.

Mount Vernon Lodge 202 is splendidly located in its new hall, corner of Pennsylvania avenue and Third street, S. E. The location is much more convenient than the old hall and the furnishings are ever so much better.

The sisters were all so pleased with their new home that they decided to give a house-warming to celebrate the move. Invitations were sent to the brothers of No. 7, and a very nice party assembled on the evening of November 18, our regular meeting night. Our Grand President was the guest of honor. Sister Sargent delivered a fine address of welcome to the brothers, dwelling particularly on the good work done by the Ladies Society, and urging the brothers to do their part to increase our membership. Brother Bowersox, the master of No. 7 (I suppose I should say president now) responded on behalf of the brothers, thanking the sisters and promising the cooperation of the brothers in all matters pertaining to the interests of the allied orders.

After the speeches we had music and dancing for those who enjoyed that sort of thing, while those who did not dance separated into groups about the hall and enjoyed a happy evening of kindly social converse. Then came ice cream and cake, after which the gathering broke up and the brothers and sisters departed to their homes, all voting that they had enjoyed a most delightful evening. Many of the brothers and sisters brought friends who are not members of either Order, and all exerted themselves to give the strangers a good time so that they might receive a favorable impression of the B. of L. F. and E. and Ladies Society. The entertainment was in every way a pronounced success, and is sure to result in benefit to Mount Vernon Lodge.

Our lodge is in a highly prosperous condition, with all members working hard for the benefit of the society. Four new members have been added to our roster recently and several more are in prospect. The annual joint ball of Potomac and Mount Vernon lodges will take place on January 14 in National Rifles Armory, one of the finest dancing halls in the city. The brothers and sisters are working hard to make the ball a success, and there seems no reason why it will not come up to all expectations.

We are sorry to learn that Brother Donahue, a long time faithful friend of the Ladies Society, now assistant chief of the division of information of the Immigration Bureau, has been seriously ill with typhoid fever. Brother Donahue has been in the care of a physician and trained nurse for the past four weeks, but at the present writing it is reported that he is out of danger and on the road to recovery.

Jeanette Borland.

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A Letter from Virginia Lodge 146.

Virginia Lodge 146 has been sorely afflicted the past month, having lost Sister Schrock, November 26th; and again on December 8, the Angel of Death bore away our beloved Sister Morrin, Sr., leaving a vacancy that can never be filled. Sister Morrin was loved by all who knew her, and to the bereaved families the members of Virginia Lodge 146 extend their heartfelt sympathy.

We have been having a series of most successful evening meetings. Our dime social, held a few weeks ago, was a decided success. We had a most enjoyable program, consisting of a reading by little Mary Moule; piano solo, Marie Burge; reading, Mabel Powley; vocal solo, Theo. Rhinert; piano solo, Miss Marchant; violin solo, little Francis Eaton, all numbers receiving encores, after which games were played, some playing cards, while others tried to see how many beans they could carry on a knife across the room and place in a bottle. We also had a flashlight picture taken. This gives only an idea of the good times we have, and now to all sisters "A Happy New Year."

"Thus it is I greet thee,
  With hearty good wishes and true,
And may every year only meet thee
  Life's journey again to renew."

Margaret L. Powley.

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New Lodges.

Wild Rose Lodge 252, organized December 2, 1908, at Eldon, Missouri, with twelve charter members. Organizer, Mrs. Ella Dearing, of Lodge 151, St. Louis, Mo.

Little Blue Grass Lodge 236, organized December 16, 1908, at Covington, Kentucky, with six charter members. Organizer, Miss Cornelia Perry, of Covington, Kentucky, who transferred from Holly Lodge 70.

Mt. Chipta Lodge 254, organized December 14, 1908, at Salida, Colorado, with seventeen charter members. Organizer, Gertrude Henry, of Minturn, Colorado, member of Lodge 136.

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Big Ten.

Below is given the membership of the ten largest lodges of the Ladies Society of the B. of L. F. and E., as reported January 1, 1909:

1.	No. 3, Hazel, Peoria, Ill.	124
2.	No. 142, Empire, Buffalo, N. Y.	121
3.	No. 60, Pride, Harrisburg, Pa.	102
4.	No. 70, Holly, Buffalo, N. Y.	88
5.	No. 151, Missouri, St. Louis, Mo.	81
6.	No. 113, Ft. Orange, Albany, N. Y.	81
7.	No. 51, Grayson, Denison, Texas	75
8.	No. 125, Charity, Jackson, Mich.	75
9.	No. 15, Forest Flower, Cleveland, Ohio	72
10.	No. 146, Virginia, Chicago, Ill.	65
11.	No. 10, Helpmate, Elkhart, Ind.	65

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Letter from Charity Lodge 125.

"Don't count your chickens before they are hatched," would certainly be a good motto for Charity Lodge 125.

We have received eight applications for membership during the past two months, but as yet only one applicant has presented herself for initiation. They seem to be slow about getting to the medical examiner. Now that the hurry and excitement of holiday time is over, we are hopeful of gathering them all in.

We are looking forward to a class the second meeting in March.

Since my last letter in the December issue of the Ladies Department we have held two very pleasant joint meetings with the brothers of 240, the "boys" creditably doing the honors in November and the ladies assuming the duties of entertaining again on the 23d of December. We are aiming to create an interest in these joint meetings in a way that will be helpful to both organizations, and with that end in view a committee has been appointed—three for each order—to assign subjects for debate and discussion; also topics for papers to members of the orders. We are hoping thereby to gather much that will be interesting and beneficial to all. As these meetings will occur once each month during the winter, we feel sure that many enjoyable hours will be the result.

The new year is before us with all its opportunities for improvement, and I can think of no better way to manifest our interest in the Ladies Society than by making a firm resolve—each and all of us—to be better members in every way; to live more faithfully to the precepts of our obligation; to encourage our presidents in their work by being prompt in our attendance at meetings, by doing all in our power to make those meetings a success, and above all do not expect more from your presiding officer than you are willing to give in return. I wish we might make the year 1909 a banner one in the history of the Ladies Society, and I feel confident that if we all do our best with that end in view we can but be successful.

Charity Lodge has met with an affliction hard to realize; namely, the first loss by death of a member. Sister Emma Palen died at the city hospital January 3 at 8:30 p. m. following an operation. She was a bright little woman, the devoted mother of two dear little girls. The husband, one of 240's members, is stricken with this overwhelming sorrow, and while we all extend to him our deep sympathy, none can realize how hard the trial is for him. The affliction has saddened the new year for him and for the little ones, but God has them all in His keeping and will show them brighter days by and by. Charity Lodge has been organized nine years, and this is the first member to be called home. It is a sad blow to the lodge, as our new year had started out so brightly. Truly,

"We know not what shall befall us
As we enter another year,
But the past is safe in God's keeping,
The future His mercy shall clear;
And what looks dark in the distance
May brighten as we draw near."

Charity Lodge extends a hearty, happy new year to all brothers and sisters of the best brotherhood that ever was organized, and may the months to follow hold much that is good and joyful for all.

MRS. LOUIE STODDARD,
Jackson, Mich.

* * *

*Why American Mothers Fail.**

"You wish, O woman, to be ardently loved, and forever, even till death! Be, then, the mother of your children."—"LENANA."

Mothers are the gardeners of the human race. There is no office under the divine government that approaches theirs, because none other is so closely allied to it.

Any system of education that fails to impress upon our girls the immense civic value of motherhood, its imposing dignity, its grave responsibilities to the state itself, fails of its purpose. Any system of education in our republic that does not instill, from the start, into an American boy, the fact that this government is rooted in his vote and that of his comrades, fails doubly of its purpose.

Our much vaunted public school system, which we shake like a banderole in the face of Europe, does neither of these things, or rather it does the former not at all and the latter most perfunctorily and inadequately.

The reason that girls are not taught the dignity of motherhood is only too obvious; it is but the usual crude, shame-faced American way of totally ignoring the wholesome primal elements of human life. Our schools shirk the responsibility by claiming that such counsel should come from mothers. And the mothers are rare indeed who do not ignore, generation after generation, this fundamental problem.

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*By Anna A. Rogers. Reprinted by permission of the Atlantic Monthly.

Between the two negligences girls practically are never given this larger point of view, which would be good not only for the state, but also for their own personal uplift above that sense of personal failure that so often comes to us all.

The boys are not inoculated with the germ of citizenship because their education is too often left in the hands of routine teachers totally incapable of any large outlook upon life, or else of those whose hands are tied by convention. Again, neither parents nor schools do their duty by the boy any more than by the girl. There are no state or federal laws to force recognition of such vital questions; to direct, *at once*, the hearing of American boys and girls to that deep national note that would bind them to life's bigger harmonies, to those larger relationships of the individual to government and society. These two sentiments alone, thoroughly instilled in the flexible minds and hearts of our young people, would, later on, stay many a hand bent on the social suicide of divorce; and also in two generations would begin to make for good in the world of politics.

Unfortunately, educational legislation is slow to recognize its own shortcomings, slower still to rectify them. American men, as a whole, are as strangely weak and invertebrate in their relations to their children as they are in their relations to their wives. The quicker remedy lies there. But only a riper, sounder civilization, with enlarged vision, will see its utmost needs and make its demands.

So, after all, it is to the mothers one must speak with lowered voice: to the gardeners, some wise and some unwise; some patient and some restless; the strong of vision and the near-sighted gardeners, working among the human seedlings and young plants in the great garden called society.

Fathers are seldom more than the florists connected with the hothouses. They deal almost solely with effects; after the mothers have done, well or ill, the work down in the dark under the blossoming plant, digging sometimes very blindly among the twisted roots of cause.

So it has come about that when the young children in her care grow awry we inquire of the mother and her methods; just as we bespeak the truck gardener when our vegetables are amiss, or a horse breeder when our cattle breed down along degenerate lines.

A successful mother (fighting both heredity and individual bias) is a more important factor in a municipality than any merely successful man in it; much more important, were she but made to realize it. For motherhood is a thing apart, "a distinct and individual creation; different from anything else God ever thought of," said, in all reverence, an American preacher. Her position has in it all the tragedy of lifelong isolation in the performance of her work; all the pathos of vast expenditure of vitality with no personal reward. The millionaire railroad official, once an office boy, gets his reward for tremendous labor, in power and money; the scientist gets his in the world's recognition of his accomplished work. The mother's reward is spiritual, and lies only in the work itself, for she has not the stimulus of an audience, and few indeed are the children who recognize their mother's struggles, their mother's sacrifices. As to her love, they accept it as they do the air they breathe; and who of us stops to thank oxygen and nitrogen for combining so conveniently for our benefit?

All of this purposely leaves out the mother's emotional reward, for reasons that will appear later. Much more important than any matter of sentiment is it that she should learn that she is doing something for her country, apart from all the very best efforts of man. It would not be amiss if in every home one found this sentence of Phillips Brooks's, illuminated and hung well "on the line:" "No man has come to true greatness who has not felt, in some degree, that his life belongs to his race, and that what God gives him He gives him for mankind."

There is a pathetic hopelessness about many mothers. One so often hears them wearily say, "I've given up my whole life for years to my children, and yet it seems to have failed. They are not as I meant them to be, nor as I hoped that they would be. What is wrong? I wish someone would help me."

It is suggested, in all humility and tenderness, that there are several things going amiss in the human garden. In the first place, it takes something besides feminine hearts to manage men and the offspring of men; it takes feminine brains, every wisdom-tipped arrow in a woman's quiver. Nine times out of ten, women put too much emotion, and not enough judgment, into both wifehood and motherhood. Everything has combined for centuries to bring this about. Much of the discontent of the present day among women is based on the fact that they do not yet realize that their life tasks are not properly merely emotional at all, but pre-eminently intellectual. It is safe to say that if a woman finds that her life makes no use of her intellect, she is a bad housekeeper, a poor wife, a poorer mother, a useless citizen.

The best wives and mothers manage to preserve a certain mental aloofness from their husbands and children, the better to estimate with justice the task ahead. It is precisely that faculty which differentiates a woman from a tigress, whose mere emotion, considered by itself, in both relationships is no different *in kind* from the woman's own. One can count so absolutely upon the basic emotionality of women, that a deal of excision will still leave an abundance for the joy of man and his everlasting bewilderment. The whole present tendency in life is to the overdevelopment of emotion among men, women, and especially children; and little or nothing is done to keep it in its proper proportion. As sentiment has been dying out in modern life, its place seems to be taken by nerve excitation; by a craving for agitation of any sort.

The present madness for speed over the seas, through the air, through the solid earth itself, unduly develops a sort of pleasurable trepidation among adults; as those so-called "amusements" at "resorts" both terrify and fascinate the unfortunate children who are allowed to flock to them. The hourly intrusion of news racks our nerves. It is the opium of this generation which we cannot long remain without. That hitherto restful week at sea, upon which overtaxed men and women could once count in simpler, slower times, is being taken from us forever.

Music is becoming more and more emotional as time passes. In the drama surely Sardou and Ibsen take more out of their auditors than even Shakespeare ever did. A novel must leave a man breathless, or he is bored; so too an afternoon drive. Winged Mercury is the god of the hour. A bit of a rascal, to be sure, but he "gets there!" There is no peace to be had, no restful slow-sipping of life that once satisfied our strong-nerved forefathers.

Woman has but drifted with the rushing current. Her wifehood is generally measured by the yardstick of her pleasurable emotions; her motherhood very often by a series of passionate instincts which are allowed full sway, as if representing directly the word of God in a household. What is really needed to precipitate both peace and progress is, not the elimination, but the firm control of emotion and instinct, by cool, deliberate feminine wisdom—all of that which should have been transmitted to her before marriage and motherhood, and all that she has herself since discovered.

Marriage and motherhood still come into a girl's life, even in this materialistic country of ours, in succession of blinding emotional flashes, standing vividly out against the dark sky of utter ignorance. She is left bewildered, groping in the dark thereafter, feeling about her nothing stable, but only more and more, and ever more—emotions!

Ignorant of her subject, criminally unprepared, her children are often a mere series of unsuccessful experiments, which she tries, rather frantically, one after another, as each child presents new problems. For Nature has a trait which greatly complicates a mother's work: a mysterious passion for seemingly useless differentiation within a given species. This forces the mother both to pass new laws and to constantly revise old laws in her government code.

"Human experience, like the stern lights of a ship at sea, illumines only the path which we have passed over." It is the searchlights for which we are pleading.

If a mother would but strive to put less heart into it all, and more mind! If she would but look with wide open eyes and say to herself, "I will make the care of my children an intellectual task. I'll put into it what brains I have, as I used once to do into literary, philanthropic or social matters. This is the most important of all, for it embraces everything else. It's not a mere question of alternating love and tears, fierce pride and frantic despair."

Her duties in the garden are three: 1. Watering the seeds. 2. Pruning the young growing plants. 3. Killing the offending insects at the blossoming time. And ever and always weeding is to be done, from the early spring till the snow comes.

I.—THE SEEDS.

On the whole, too much time is given by an American mother to her child in its infancy, between the first and the third year; too little time from the fourth to the tenth year; and after that she allows others' opinions, much too often, to dominate her own in both the mental and moral development of her family. She has come to think that the task is no longer hers.

Thus it has come about that education has so largely become the cumbersome convention that it undoubtedly is. The fathers in the United States leave it to the mothers; the mothers leave it to the schools; the schools, public or private, are generally in the hands of narrow specialists, "common-schooled and uncultivated," in the sense that "culture looks beyond machinery," as Matthew Arnold said of us. So many parents feed their children blindly into the educational hopper, and then walk to the spout at the other end to receive unquestioned the "finished" product. Schools override the mother's own intelligent convictions; Sunday schools take the place, and most inadequately, of her own sense of morality.

Nothing of this is as it should be. If a mother ever sinks into the background of her child's life she has no one to blame for it but herself. She has not risen to the task, that's all. Love has not proved itself everything in the solution of her problem. She can supplement the crudities of the child's mental schooling, and should leave Sunday schools for the motherless. No one can know, as she does, the weak spots in her offspring's character.

The love-madness of a young mother for her tiny infant, poetical and picturesque as it is, is harmful in many ways. It is to a great extent a sensuous obsession to which in this country the husband and father is, all too often, ruthlessly sacrificed. If this sacrifice were in the least justified by the needs of the infant, there would be little to criticise; but it is distinctly not so justified in the average middle-class household. A phlegmatic nurse whose ministrations are rooted in duty alone, is not only equally as good for the baby, but is very much better. It is but a seed, and all the better, as are other seeds, for being left undisturbed to sleep its way into life.

If the child does not need all this frenzy of watching and excited coddling of the more or less hysterical mother, then it is not only unwise but cruel to subject the bewildered young father to the half-tragic, half-comic tyranny of an American household ruled by a young baby.

The violent *hushing* that he receives at the front door, the complete ignoring of all of his rights, the needless neglect hour after hour while his wife—pardon, his baby's mother!—worships at her new shrine, emphasize the unbalanced emotionality of most of our young women. Those hours of heedless neglect on the part of his wife are very often the entering wedge which some day will separate the two. The child, instead of bringing them closer together, is the innocent cause of their growing apart. At the root of it is not too much love, but too little mental balance. Moreover, the contention is made that it is not wholly love which blinds her, it is to a certain extent the emotional indulgence of a febrile uncontrolled young woman adrift on the sea of a newly discovered instinct.

"Knowledge is the parent of love; *Wisdom. love itself.*"

If it is claimed that the national curse of poor servants is the cause of this undeniable obsession of young American mothers, the reply is ready: "Why then is it that between the years of four and ten American children do not see enough of their mothers?" The servant question is surely no nearer solution, and no apathetic nurse can then give the child what the mother can and should give.

II.—PRUNING THE YOUNG PLANTS.

More than one American mother has admitted to the writer a curious sudden reaction of indifference against her once worshiped baby after the fifth year. The ecstatic mother-passion of earlier days has mysteriously fled, just as the wife-ecstasy had fled in its turn. She admitted it, as if it were an interesting psychic phenomenon, and she helpless to right it—just when the child really begins to need her tenderness, her time, all of her wisdom and gravest consideration!

Every one of these successive phases of motherhood could just as well have been taught her years before, taught her to watch for, guard against, and meet intelligently when the issues presented themselves, one by one, in her own life. Some new factor must be evolved in our national life to fill successfully this gap between four and ten in our children's lives.

Only when enforced by poverty do a large number of American mothers themselves care for their young children, beyond mere physical needs. They would not trust the little impercipient life at first to a nurse, however staid and competent; now, more often than is good to see, an ignorant nursemaid of sixteen years becomes the predominant element in the child's life. Manners, morals, mental needs are left largely in her hands—and she is a mere child herself. The physical needs, at least as far as cleanliness is concerned, generally remain in the mother's hands, but the question of the child's diet runs riot in more American households than is at all realized. If the child is well dressed, its hair and teeth in perfect condition, it is turned over to the nurse from eight in the morning till eight at night.

Can it be that we had much better adopt from England the nursery governess and the nursery table? The former (with all her drawbacks) is infinitely more competent than our mere "nurse girls;" while the latter institution insures the simple diet of which our children are in such dire need.

At least we should be spared the sight of an elaborately dressed American baby of six, entirely unattended, walking into a huge hotel dining room where her parents had lived for years, and ordering "deviled crabs and pink ice cream" for her dinner, which the poor little creature actually ate amid the smiling glances of the guests and waiters! It was no less than a painful sight, and by no means an isolated instance. What was inevitably ahead of that child? Her digestion ruined, her vanity, her independence forced before their time, her whole sensibility blunted. Even hotel life need not spoil a child, if less money were spent on her clothes and her mother's, and part of the saving paid in fair wages to a first-class governess, who would remove the little one from flattering glances and place her in a world where "deviled crabs" would remain an unknown temptation for many a long year to come.

If those American mothers who labor so many hours in torturing some flimsy material with drawn-work or embroidery would but give the same time, or even part of it, to the little child's spirit instead of its body! Very often we see a princelike body, carrying a starving little soul—starving for companionship, for healthy amusement, for that sense of comfort that strict but intelligent discipline alone brings alike to children and to servants.

Children's amusements in this country are undoubtedly becoming more and more artificial. Why? Because it makes the mother's and nurse's task easier. Examine the situation from whatever standpoint you choose, every face shows this deplorable fact. To feed and clothe a child of five is a very simple and expeditious matter compared with amusing that restless little bundle of activities. And yet in a long life the writer has known only one mother who took upon her own shoulders the entire amusement of her family and five children, leaving the sewing to the nurses! There were no theaters, no vaudeville, no circuses nor hippodromes to bewilder and exhaust those children's minds; no mechanical toys, no elaborate paper dolls "made in Germany." They had hammers, nails and some boards; pieces of treasured Bristol board, scissors, paste and a little paint box, and the "stay-in" days flew by, given over to the joy of creation under the sympathetic direction of that mother, who sat in a low chair, close to their level, that she might be one of them. On the out-of-door days they were tumbled into a little wagonette, which was their nursery. The old pony was driven by the mother herself; the best child of the day sat beside her in the seat of honor, and off they jogged to the woods or the beach, both of which were happily accessible. Their simple lunch was devoured afield. The mother invented, directed and entered into all their games—the merriest of them all. But the charm of an ocean beach is supreme and needs no human aids; so once she gave a push to the little eager minds, off they slid, enthusiastic and contented for hours. The mother whipped out a book from under the carriage seat, and so got to herself a couple of hours of coveted reading. For she was a brilliant, cultivated woman, knowing several languages—and yet was content to spend it all lavishly for thirteen years of her short life upon her children.

This inspired mother claimed that it was far less of a strain to play with her children than to punish them; because a large percentage of the sins of childhood are based on lack of intelligent diversion. From this mother came no whine about her wasted talents. Because she made use of them! During the severe winters she made her incessant task of reading to her children tell significantly. Before the eldest was ten years old they all knew almost every nook and cranny of Walter Scott, and other standard works followed in turn. She read certain idyllic tales written in French, which she translated aloud into simple English, thereby diverting herself as well as the children. It was years before they even knew what she had done. One of that family told me that he had never read a current book of fiction until he was sixteen! His taste had been formed without any long-winded lectures on literature. Froissart, Aesop, Josephus and Bunyan were household words.

Later, the mother wrote little plays full of fire and sword, into which was smuggled many a spoonful of history, or mythology, or poetical legend. The children were the eager little stock company. She rehearsed them, suggested costumes and scenery; and yet, with all this prodigal expenditure of time and real talent, she always laughingly claimed to other mothers: "Try it! They are happier and so am I. Idleness and absence of motive lead to crime in the nursery as well as the street. And as for me, I know exactly what they are doing, and how."

Hers was a rarely rich, successful life. That she was a much-loved woman to the end scarce need be recorded of her.

Within a year the *dernier cri* in child amusement at a charitable *fête* brought vividly back, through contrast, that picture of fine motherhood. Kinetoscopes depicted, for tents reeking full of feverish-eyed children, fictitious scenes of Russian cruelty ending in a most revolting form of murder! Little breathless voices asked in the dark: "What does it mean, mother?" "Why does he hate her so much, mother?" One strained in the half light to see such mothers of little beings who would have been so happy merely roaming through the adjoining meadows! Then later came another "amusement" for the children. A real hose and ladder company, a real fire engine, rented for the purpose; a fire alarm, the burning of a small wooden house erected for the purpose, the realistic rescue of a straw mother and child—all for the amusement—save the mark!—of those watching babies! The whole thing was absolutely insane in its blindness to the real needs of child life. No wonder we see them blasé at eight, nervous wrecks at twelve, neurasthenia, insomnia, dipsomania, decadence ahead of them. And the committee who made out this program (including many another "sensational feature") was composed of *the leading women* of the city in which the festival was held. Where were the mothers to wipe out with justifiable wrath such a breach of sane thinking? such an outrage to the most obvious of responsibilities?

Our American communities are quick to regulate child labor in some wretched household where the pennies count so much; but one seldom hears of any laws to regulate children's amusements among the many comfortable homes where the mothers are either too weak, too silly or too selfish to make and enforce their own laws.

And so the weeds come thick and fast and choke the young growing plants—the weed of vaudeville, killing the sense for true dramatic art; the pest of ragtime, killing music; slang, choking language; indiscriminate current novel reading, fatal to any good reading in the future; the devastating weed of unhealthy excitement, to blight, for all time, any simple wholesomeness of either thought or feeling.

A law prohibiting children under the age of fifteen from entering any and all theaters might well be passed with profit, taking out of the incompetent hands of mothers any volition in this grave matter. It fills the air—this craze of the merest children for cheap shows in this country; it packs their minds with vulgar trivialities, debases their ideals, perverts their taste. It is becoming daily more frequent. As well feed a child on mushrooms and champagne, and expect it ever afterwards to relish bread and milk.

It is but a repetition of that poor, neglected baby and her "deviled crabs and pink ice cream!" One sees hundreds of examples of it, in one form or another, every year of living in this country. At the root of it, in every single instance, is an unwise mother. Her children remain ignorant where they should be familiar; become enlightened where they should be blind; and suffer always from enlargement of the emotions.

Within a year the writer saw at a hotel an eager group of beautifully clad little ones gathered every evening between seven and eight about a middle-aged cripple who told them stories. They were breathless, entranced. That it was a perfectly new element in their lives was apparent. To be deprived of it was the severest punishment in that colony of several hundred souls. A young woman was overheard idly to observe to her companion, "Isn't it a charming sight?" The older woman with her replied angrily:

"It is distinctly *not* a charming sight! It is shocking! What are they, with all their extravagant clothes, but the starving children of selfish, vain mothers? That unfortunate man simply fills up an awful gap in their lives—every mother as she sees it should blush and hang her head. Out of that score of children there is not one who has ever had an adult give it any real companionship before in its life. I have taken the trouble to verify this—and so I say again, that picture over there is far from being charming!"

(To be continued.)

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Letters from Friends.

FROM L. S. 98—(*Cora D. Codington, Los Angeles, Cal.*) I have read the columns of the Magazine for the past two years and am sorry to say have heard nothing from Orange Blossom Lodge 98, so I will take it upon myself to let the sisters know that 98 is still living in Los Angeles, Cal.

Our lodge is steadily growing, as we initiated two at our last meeting day and still have one application on file.

We had a joint meeting November 24 with sixty-eight present. Our worthy president, Sister Rosanna M. Farrow, called the lodge to order. Beside her sat Bro. G. H. Farrow, Master of 97, and Bro. Albert H. Hawley, General Secretary and Treasurer-elect. We had a very interesting meeting and a talk from Brother Hawley, this being his first attendance at a joint meeting. Remarks were then in order from the different brothers and sisters present, which were enjoyed.

At the close of the meeting the mats were rolled from the floor and the musicians called in and dancing was vigorously indulged in. While engaged in dancing the brothers were handed slips of paper upon which were written titles of songs. The brothers held the first half of the title and the sisters the last half. In this way partners were secured for supper, after which an elegant banquet was served.

The golden oak rocker which was so kindly donated to us by Frank P. Codington of the firm of the L. S. undertaking company, was sold at auction. Brother Hawley was asked to auctioneer. He replied: "I have done most everything else, but this is my first experience at auctioneering." The chair was purchased by Bro. Ed Kelley. We realized a clear profit of $21.50 as a starter for our social fund.

Bro. A. H. Hawley expressed himself as having spent a pleasant evening several times, and we sincerely hope to see him again soon.

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FROM L. S. 62—(*Mrs. Daisy B. Sampsill, Elmira, N. Y.*) Winola Lodge 62 is not asleep, although nothing has been heard from it during my membership, but I have only been a member since last February.

We have been "in the depths," so to speak, but last February we decided we had slept long enough and that we would climb out of the rut into which we had fallen and get to work. Since then we have initiated eight new members and given one withdrawal card.

We organized a "Thimble Club," which is proving a social success. At our last meeting we started a quilt which will be disposed of when completed and the money turned into our convention fund, as we intend to send a delegate to our next convention, God willing.

Our club meets at the homes of the members in the afternoon, once a month. A lunch is served by the hostess of the day, for which five cents is charged. Three articles to eat and one to drink are all that is allowed to be served.

We have had a good attendance and fine times and accomplished a lot of work on our quilt.

We also have a tea at our hall whenever we have initiation. It creates a good impression and gives all a chance to become acquainted with the new member.

We find that if a lodge has nothing to work for outside of the routine work in the lodge room interest soon is lost, hence our thimble club. A great deal of interest is now manifested in our lodge, while a year or two ago it was difficult to hold a meeting with any regularity on account of lack of attendance and interest.

Trusting Winola will be allowed to report progress every once in a while, I will close with best wishes to all lodges.

FROM L. S. 51—(*Mary Platt, Denison, Texas.*) Here we are again to greet our sister lodges from all over this broad land with love and good will. Winter is here with its mantle of frost and snow as old age crowns our head with the snowy hair, and 'tis all from our Father, and who can say it is not beautiful?

Fifty-one still continues active. Brothers and Sisters Johnson and Rucker have each lost a little boy. We deeply sympathize with them in their great sorrow, also with Brother Hancock, who has had the Death Angel visit his home also. So in the midst of life we are in death.

At our last joint meeting we enjoyed a tacky social and charged ten cents admission to non-members. The costumes, needless to state, were not of the latest style, and much merriment was caused over them. The tables were decorated with sunflowers and cockle burrs. Refreshments consisting of lemonade and doughnuts were served, after which games, music and dancing made the hours pass all too quickly.

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FROM L. S. 223—(*Jennie Bench Mansfield, Ottumwa, Iowa.*) Having enjoyed the letters of others for so long a time, will write a few lines about our lodge.

We have been on the "standstill" for quite a while. During the summer so many were away on visits and quite a good deal of sickness among us, so our meetings were not well attended as usual.

On the 6th of July last Lafayette Lodge met in secret session. After work was done the L. S. was invited in and we had joint installation, which was enjoyed by all, not as much though as the ice cream, cake and lemonade that the boys served to us. After a pleasant evening we all went home thinking our very own two lodges the best in the world.

I am sorry to report that our V. P., Sister McCaull, lost her mother in September. Words can't express our sympathy. I can think them, but I am not able to put them on paper.

Since our last writing two "bran" new daughters have come to our small circle. Baby Irene at Sister Cunningham's (and as papa Cummy had just been made an "Eagle Eye," for the first few weeks it was a "site" to see him going bareheaded—couldn't find a "fit" anywhere) and a daughter came to the home of Sister Harper, her name being Dorothy Winifred. Brother Harper survives nicely.

Sister Giltner has returned home and has lots to tell us about the convention, she being our alternate delegate, Sister Maud Oakes, our delegate, being too ill to take such a long journey. It was a sad disappointment to her and Brother Oakes, he being delegate and also Master of 293.

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FROM L. S. 207—(*Lucy D. Morris, Pueblo, Colorado.*) We gave our third annual ball on Wednesday evening, November 25, 1908, which was well attended and a good sum realized.

On November 18 occurred the marriage of our chaplain, Sister Elva Suddith, and M. P. McMillin. Brother McMillin being the Master of No. 59, makes it all the more interesting. I understand they were charivaried in proper style. Long life and happiness to them.

A card party is held once a month, to which only members and those who are eligible to membership are invited. Members take turns entertaining.

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FROM L. S. 116—(*Mrs. Lillian F. Markey, Baltimore, Md.*) Pride of 214 Lodge 116 has suffered the loss of two of its members by death since the convention. Sister Catherine Kapp was taken away very suddenly by heart failure—only ill for forty-five minutes. Our sympathy is with the husband, daughter and son, who feel their loss so keenly. In less than a month we were called upon again to perform the same sad duties for Sister Florence Grimm, who passed away at the Maryland General Hospital of typhoid fever. She leaves a husband and one dear little girl, who are heartbroken over the separation. No. 116 feels this decrease in our ranks so keenly, but as "He knows it all" we commend their loved ones to Him, for "He careth for them." They shall be missed, for their seats shall be vacant.

On December 14 we held a supper and dance, which was well attended and enjoyed by all, as is usually the case. Quite a number of "the boys" were on duty and could not be there.

We are looking forward to a good time in May, when it is expected to hold a union meeting in Baltimore.

Kindest regards to our Editress.

FROM L. S. 51—(*Mary Platt, Denison, Texas.*) Well, here we are in the midst of winter, but that does not keep the sisters of No. 51 from attending lodge meeting.

We have on file seven applications and several more promised. We are having some sickness among the members, but otherwise we are all doing very well.

The brothers of Nos. 8 and 51 are planning to have a joint entertainment and Xmas tree on Xmas eve, and all are anticipating a jolly time, especially the children.

We have had two or three surprise parties among our members which were very much enjoyed and brought us into a closer relationship to each other.

As we go into the new year let us strive to be sisters indeed and not let little trifling things come among us and cause hard feelings or dissension, for life at best is short for us to be constantly holding our fellow brother or sister up to the light to find some flaw in their make-up. Let us try for this year at least "To do unto others as we would have others do unto us," and see what an ideal sisterhood we would have, and drawing the mantle of friendship and charity around all with loving, sisterly hands.

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FROM L. S. 48—(*Mrs. Bessie Roberson, Brookfield, Mo.*) As the duties of Magazine correspondent have devolved upon me I will try to give some account of our lodge here, which is certainly deserving of creditable mention, as we almost invariably have a good attendance and much active interest manifested at our meetings by each member present.

At one of our recent meetings we adopted a new rule of sending cut flowers, instead of a potted plant, which heretofore had been our rule, to a member unfortunate enough to be ill, thinking that cut flowers by their fragrance and beauty would add more cheerfulness to the sick room.

And by way of increasing our flower fund we have been mingling pleasure and business by giving first what we called a "mysterious lunch" to the public, which was well attended and from which we realized a substantial sum.

On November 18, 1908, we gave another of our pleasant socials at the home of Sister Lenna Wallace, which in every particular was a delightful and successful affair.

At our last regular meeting the subject of having a drill team was discussed, and we hope soon to have it in working order.

It has been some time since we have initiated a new member, but just now the prospect is extremely favorable to an increase in our already good membership, and with some effort (which we expect to make) on the part of our members we hope to add a number of new names to our roll call, thereby having occasion for using our uniform drill at their initiation.

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FROM L. S. 176—(*Olive Fisher, Eldon, Iowa.*) Best wishes to all.

We gave our first annual ball Thanksgiving evening, and it was a decided success both socially and financially. There were no complaints from patrons. Some of the remarks that we heard through the hall were: "We are having the best time we ever had at a ball. The music is fine. Our home music can't be beat."

Interest in our lodge is now being manifested among the ladies that are eligible, and we hope and have reason to believe that several are going to join us on the strength of the good time they had at our ball.

No. 176 extends a hearty welcome to any and all visiting sisters.

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FROM L. S. 173—(*Reinetta Cox, Ogden, Utah.*) Pearl of the Rockies Lodge 173 has been silent for quite a while, but we are still alive and actively engaged in the work of the Order.

We have a membership of twenty-two and have fairly good attendance at meetings, and all members take an active interest in all pertaining to the Order.

On December 3, 1908, we assisted the brothers of Perseverance Lodge 98 in giving a grand ball, which was a splendid success. The hall was gaily decorated for the occasion with lanterns in our emblematic colors and other decorations too numerous to mention here.

The programs were of train order style. Everybody had a very enjoyable time.

We expect to have another good time on January 28, 1909; a good supper and cards will be the principal features of the evening. We extend a cordial invitation to all brothers and sisters of other lodges to meet with us and enjoy a pleasant evening.

FROM L. S. 70—(*A Member, Buffalo, N. Y.*) It is a long time since we have heard from Holly Lodge 70, but we are still in the land of the living. At our last meeting our delegate, Sister McNamara, read a report of our last convention which was full of interest to all of our members.

On November 4, 1908, we gave a card party which was a very enjoyable affair.

On the 16th of December we are to celebrate our twelfth anniversary, and we invite the brothers and sisters to join with us to have a good time.

With best wishes for all brothers and sisters for a truly happy new year.

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Quarterly Insurance Assessment.

Second Series Numbers.

Notice No. 25, for the Quarter Ending March 30, 1909.

GRAND LODGE
LADIES SOCIETY OF THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

Office of
GRAND SECRETARY AND TREASURER.

BOONE, IOWA, March 1, 1909.

To all Treasurers of Subordinate Lodges:

SISTERS—Assessment No. 25, for the quarter ending March 30, 1909, is hereby levied upon all members holding membership in the Insurance Department of the Society on or before February 1, 1909. You will forward to this office so as to reach here on or before the 10th day of March, 1909, the sum of sixty (60) cents from each member carrying a $200 policy, ninety (90) cents from each member carrying a $300 policy, one dollar and twenty ($1.20) cents from each member carrying a $400 policy and one dollar and fifty ($1.50) cents from each member carrying a $500 policy, using the two printed blanks which accompany this notice.

All remittances to be made by draft, postoffice or express money order, payable to "Grand Secretary and Treasurer, Ladies Society, B. of L. F. and E."

Members initiated on and after February 1, 1909, will not be liable for this assessment.

MARY E. DU BOIS,
Grand Secretary and Treasurer.

Approved:

GEORGIE M. SARGENT,
Grand President.

Note.—We enclose *two printed* blanks upon which treasurers will make returns to the Grand Lodge for the above assessments. Both statements will be filled out *exactly* alike and sent with returns. If all names do not appear in the printed list they will be added. If any corrections are necessary they can be made by the treasurer. One of the printed statements, with receipt, will be returned to the treasurer.

For the names, lodge number, cause of death, etc., of deceased sisters in the payment of whose claim this assessment is levied, see issue of the Brotherhood of Locomotive Firemen and Enginemen's Magazine, where detailed statement of the same will be given in department devoted to the Society.

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Death Report.

Catherine Kapp, Lodge 116, died November 16, 1908; cause, heart failure. Insurance, $200.

Mary A. Schrock, Lodge 146, died November 25, 1908; cause, tuberculosis. Insurance, $200.

Bettie Scott, Lodge 51, died October 26, 1908; cause, tuberculosis. Insurance, $400.

Johanna Morrin, Lodge 146, died December 8, 1908; cause, general breaking down. Insurance, $200.

Florence Grimm, Lodge 116, died December 9, 1908; cause, typhoid fever. Insurance, $200.

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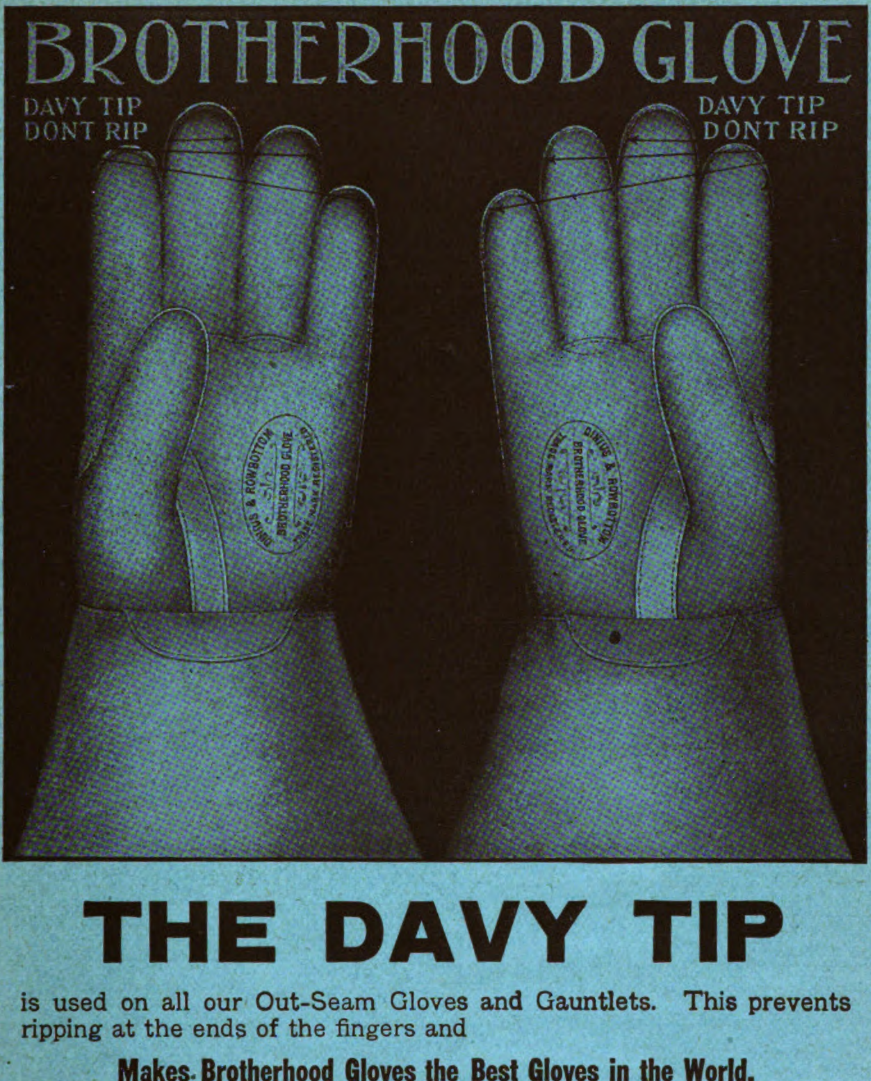


THE DAVY TIP

is used on all our Out-Seam Gloves and Gauntlets. This prevents ripping at the ends of the fingers and

Makes Brotherhood Gloves the Best Gloves in the World.

If "Brotherhood" means anything to you it means that you should wear.

BROTHERHOOD GLOVES

Made by Brotherhood Men, Made for Brotherhood Men, Union Made and the Best Made. Try them.

Manufactured by DINIUS & ROWBOTTOM

J. S. DINIUS
Member Lodge 237, B. of L. F. & E.

S. W. ROWBOTTOM
Member Lodge 237, B. of L. F. & E.

Ask your dealer for "Brotherhood" Gloves. If he fails to supply you send for them direct to

BRADT & SHIPMAN, Sole Agents
323 Main Street **DE KALB, ILL.**

WM. B. BURFORD PRINT, IND'PLS

Talk No. 2.

A PRACTICAL TALK ON ARTIFICIAL LIMBS

By LOWELL E. JEPSON, M. S., the President of THE WINKLEY ARTIFICIAL LIMB CO.

MINNEAPOLIS, MINN., U. S. A.

Continued from last issue

In the last issue of this Journal we showed you a cut of our latest improved, Patent Adjustable Double Slip Socket Leg for an amputation below the knee, and called your especial attention to the fact that the inner socket and the stump act as one, and this inner socket being suspended from above in the outer socket brings all the up and down and twisting motion between the two sockets instead of upon the stump, thereby relieving the stump, in the act of stepping, from all rubbing, irritation, pulling upon the end and chafing, and we wish to again emphasize the advantage of relieving the stump of this twisting motion secured only in wearing our Double slip Socket Leg.

S. T. MINOR
WICHITA, KAS.

The advantage of bringing this swivel motion between the two sockets instead of upon the stump is well illustrated by the accompanying picture of Mr. Minor while in active service. His right leg is amputated some ten inches below the knee. The shoe and clothing were removed in order to show the artificial leg just as it is worn. It is very easy to see that in firing an engine or in any similar work that a certain amount of twisting comes upon the artificial as well as the natural leg and unless this swivel or twisting motion is brought between the two sockets it will necessarily come upon the stump, as is the case in wearing all other styles of legs.

Some twelve years ago we furnished Mr. Minor with one of our Double Slip Socket Legs, made from measurements and cast of stump without leaving his home and on May 3, 1903 he wrote us:

"My leg still gives satisfaction. My run is 150 miles each day and sometimes double. I make about 4200 miles per month and the leg has never chafed the stump even in the hottest weather."

We have recently furnished Mr. Minor a new leg also made from measurements and we are in receipt of the following letter:

Wichita, Kansas, Oct. 23, 1907.

My new limb has been received and is working O. K. and feels as good as the shoe on my natural foot. I will send old limb for repairs in the near future.
S. T. MINOR.

We now wish to show one of our Double Slip Socket Legs for an amputation above the knee, as seen on this page. This leg is also especially adapted to meet the requirements of active railroad service, as is well illustrated by the following letter:

Amputation above the knee, ten inch stump.
Leg made from measurements taken at home and without visiting factory.

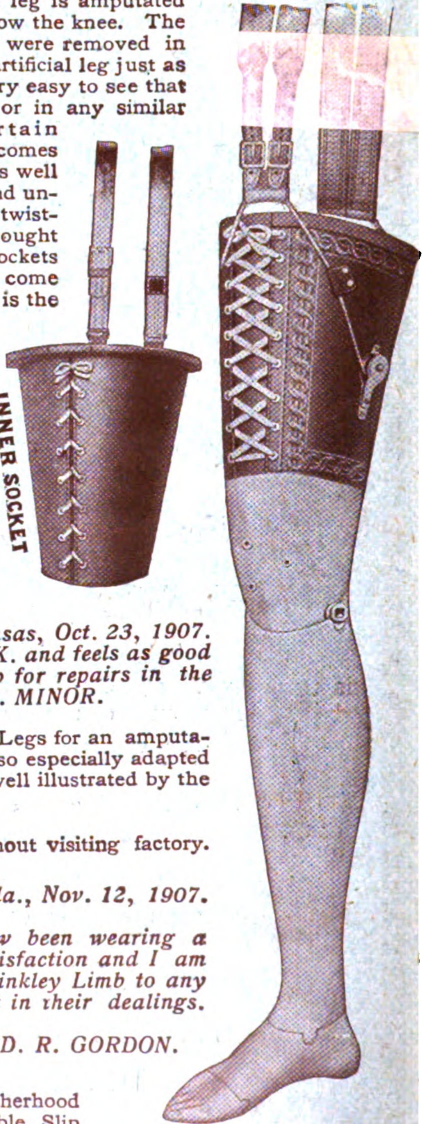
Muskogee, Okla., Nov. 12, 1907.

Winkley Artificial Limb Co.:—

I belong to Lodge 140 B. of L. F. I have now been wearing a Winkley Limb about a year. It is giving perfect satisfaction and I am running an engine again and I can recommend the Winkley Limb to any one, also the Winkley Co. as being just and upright in their dealings. You may use this letter as a testimonial if you wish.
Yours truly, D. R. GORDON.

We are in continuous receipt of letters from Brotherhood Railway men in active service now wearing our Double Slip Socket Legs, as worthy of a place upon this page as these two shown.

(TO BE CONTINUED IN NEXT ISSUE)



For amputation above the knee, with inside socket taken out of its proper position in order to show its construction.

BROTHERHOOD OF

Locomotive Firemen and Enginemen's Magazine

Published at INDIANAPOLIS, IND.
by the
Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

The Way These Gloves Stand The Racket of Railroading Will Surprise You—

They're neat and handsome, too—don't look much like work gloves—and are so soft and comfortable that it's a pleasure to wear them.

Because of our special chrome process of tanning, the "Reindeere" and Coltskin leather used in Grinnell Gloves is soft as kid, but as tough as rawhide—it sheds water like a duck's back, resists heat and wears like iron.

If you wish, you can get many exclusive conveniences in Grinnell Gloves. The patented **"Rist-Fit"**—a "V" of soft leather set in the cuff, when tightened by a sliding strap, holds the gloves securely in place and keeps out dust and dirt. Another exclusive convenience found in some styles is the **Ventilated** back.

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TRADE
Grinnell
MARK

Gloves

Get a Pair Free

If your dealer doesn't handle the Grinnell line, send us his name, your size and the style you wish, and we'll send you a pair with his first order free.

For comfort, fit and *wear* — insist upon **Grinnell Gloves.**

Morrison-Ricker Mfg. Co.

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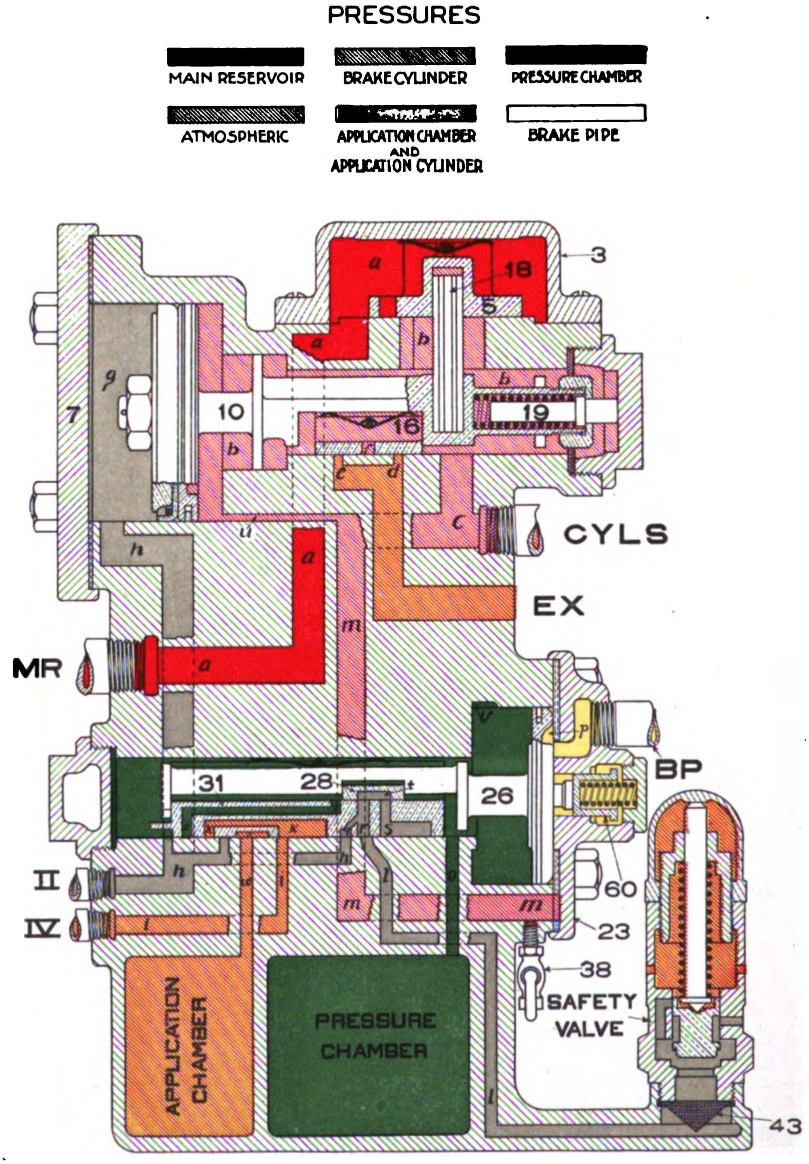

Locomotive Firemen and Enginemen's Magazine Educational Charts

WESTINGHOUSE AIR BRAKE SERIES

PLATE XLII—DISTRIBUTING VALVE, No. 6 ET LOCOMOTIVE BRAKE EQUIPMENT

(Emergency Lap Position)

BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

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VOL. 46 NO. 3 INDIANAPOLIS, IND. MARCH 1909

Plate XLII—Distributing Valve, No. 6 ET Locomotive Brake Equipment (Emergency Lap Position).

Plate XLII of the Westinghouse Air Brake Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts shows the distributing valve of the No. 6 ET equipment in Emergency Lap position, which is really the second step of the phase of *emergency application*, or, so far as position only is concerned, any extremely heavy service application, that was explained in the preceding number of the Magazine; a comparison will show that the position of the equalizing portion is not changed, and the *lapping* only refers to the upper, or application, portion. In an emergency application the brake-pipe pressure is reduced to vastly less than that of the pressure chamber of the distributing valve—commonly, it is completely discharged—and the equalizing piston, *26*, moves through its extreme traverse to the right, compressing the graduating spring, and is held in the emergency position by the pressure-chamber air. As explained in last month's Magazine, the original 70 pounds in the pressure chamber equalized with the application cylinder at about 65 pounds pressure; if the application was made in any other manner than by using the emergency-application position of the automatic brake valve on the same engine, the pressure in the application cylinder would remain at 65 pounds throughout the application period and maintain an equal pressure in the locomotive brake cylinders; but we are now interested in a phase of action of the distributing valve that comprehends its widest range, and we will assume that our automatic brake-valve handle *has* been turned to the emergency-application position, in which a port in the rotary valve supplies main-reservoir air to the application-cylinder pipe, and this *maintaining pressure* entering the distributing valve at *II*, and flowing through port *h* increases the application-cylinder pressure until it becomes 68 pounds and the safety valve opens and prevents it rising any higher, the red hand of the small, duplex gauge indicating its equivalent in the locomotive brake cylinders.

It will be noticed by the engineman that as long as the automatic brake valve remains in the emergency-application position there will be a continual blow-off, and the reason why the brake-cylinder pressure will not exceed the figure at which the safety valve is set, from the supply of main reservoir air, is that the small passage between cavity *q* and port *r* in the equalizing slide-valve restricts the flow of application-cylinder air to just the capacity of the safety valve for blowing it off; if the automatic brake valve should be returned from emergency-application position to that of lap, the rotary valve would cut off the supply of maintaining pressure and the safety valve would close, the application-cylinder pressure then holding indefinitely at nearly 68 pounds.

From the high-speed brake-pipe pressure of 110 pounds, the initial equalization will amount to 93 pounds in the application-cylinder as the result of the automatic brake valve going to emergency-application position, and this will be blown down to, and maintained at, about 75 pounds—higher than the pressure to which the safety valve is adjusted, for the reasons that were given in explanation of last month's chart.

Lap of the application portion of the distributing valve is exactly the same, as to position, after any kind of an application: and the effect is always the same as to the brake-cylinder pressure supplied, for any given pressure in the application cylinder. In the chart in the February number of the Magazine, application valve *5* was open and main reservoir air was flowing from chamber *a* to chamber *b* and the locomotive brake cylinders, and the coil spring in the end of the spindle of piston *10* was compressed by the stem *19*, striking the cap nut; that position was the result of the pressure in the application cylinder, *g* (68 pounds), acting against piston *10*; but as soon as the pressure in the brake cylinders and chamber *b* had become a little greater than the application-cylinder pressure, piston *10* was forced to the left as far as the extension of the coil spring could move it, and when that point was reached a shoulder of the piston came into contact with exhaust slide valve *16*, which offered the resistance that stopped the piston just as soon as application valve *5* had covered the port in its seat—was *lapped*, and in the position shown in the subject chart.

Whether the application portion remains in the lap position during the period of brake-pipe reduction depends upon the question of brake-cylinder leakage; if there is none, the parts of the distributing valve do not move from their positions as shown; if the locomotive brake-cylinder pressure does begin to reduce from leakage, the pressure in the application cylinder at once moves piston *10* to *application* position, which is understood, and the amount of air that had leaked from the brake cylinders will be resupplied, after which the application mechanism will return to the lap position as just previously explained; and this maintenance of brake-cylinder pressure is perpetual as long as the pressure holds up in the application cylinder and there is as much in the main reservoir.

In explanation, in the February number of the Magazine, of the No. 6 distributing valve when the automatic brake valve has been placed in emergency-application position in high-speed brake service, it was stated that at the beginning of the application the application-cylinder pressure is about 93 pounds, and that it gradually blows down through the safety valve to 75 pounds, standing at that pressure during the finish of the stop; the application portion of the distributing valve does not take the permanent lap position as shown until the completion of the blow-down of application-cylinder pressure and the equal reduction of the pressure in the locomotive brake cylinders, for, although the application valve will be lapped, exhaust valve *16* will be partly or fully open during the blow-down of pressures—the application portion taking the position shown in Plate XL—and after the safety valve has closed, the wholly lapped condition will be complete by the application piston and exhaust valve moving a slight distance to the right, and all parts will have assumed positions as in the accompanying chart, except that exhaust valve *16* will rest against the *left* shoulder of the piston.

It may save questioning to explain why the pressure in the locomotive brake cylinders as the result of an emergency application, has been increased in the No. 6 ET equipment; 50 pounds per square inch was originally the limit of pressure in all brake cylinders at service application, based upon 70 pounds brake-pipe pressure, with 60 pounds the maximum when the brake was applied at emergency, and the No. 5 ET equipment was designed to accomplish the same results in locomotive braking service.

With the advent of very heavy passenger equipment cars and excessively high train speeds, the high-speed brake was devised to throw as much as 88 pounds per square inch in the brake cylinders at emergency applications, and automatically graduate that pressure down to 60 pounds, which would be permanently held during the finish of the stop. It was found, however, that adjusting the high-speed reducing valve to 60 pounds permitted that great a pressure to be used in the brake cylinders at ordinary service stops, and some roads had trouble with sliding and flattening of wheels where two-application stops, correctly made, were not understood and practiced in common service; but an adjustment of the reducing valve at 50 pounds would blow the brake-cylinder pressure too low at emergency applications. And as passenger train speeds were still further increased, it was decided upon as undesirable to blow down the maximum brake-cylinder pressure at all, at emergency applications, and that idea gave rise to the "L" type of high-speed brake triple valve and its counterpart in locomotive braking,—the No. 6 ET equipment.

The L triple valve has other new and desirable features besides the ones to be here mentioned, and will be the subject of a part-series of the Educational Charts in this Magazine in the near future; no "reducing valve" is used in connection with the brake-cylinder pressure in high-speed brake service with the L triple valve, but there is a *safety valve* attached to the triple valve that can be adjusted to 50 pounds, or whatever the railroad officials desire as the maximum *service* brake-cylinder pressure, and in making station stops that pressure cannot be increased above the stated figure; at emergency applications *the safety valve is automatically cut out*, the brake cylinder pressure is 105 pounds and remains at that pressure throughout the application; the desire is *to stop*, and 105 pounds will quickly help to do it *and not slide the wheels* at a speed rate of, say 70 miles an hour, and as the speed decreases, the coefficient of friction of the brake shoes is found to also be decreased from the excessively high temperature so quickly established, and wheel sliding rarely occurs.

The No. 6 ET equipment has been designed to meet these conditions as a locomotive brake in high-speed service; a moderate increase in brake-cylinder pressure above that of the No. 5 equipment is permitted at emergency applications with 70 pounds brake-pipe pressure, and this has been found desirable; while the greater increase of brake-cylinder pressure in high-speed service finds a reason in the desire to parallel the work of the passenger car brakes as hereinbefore explained.

The Train Rules Department of the Magazine.

Mr. H. A. Dalby, who has so long and efficiently conducted the Train Rules Department of the Magazine under the heads "Movement of Trains" and "Train Rules and Train Practice," having engaged in another line of business which requires his undivided attention, closes his work with the Magazine with the present issue, being succeeded by Mr. G. E. Collingwood.

Mr. Dalby has been one of our most highly valued contributors, and the thoroughness with which he has handled his subjects, together with the completeness of his answers to inquiries regarding train rules, has set many an engineman and trainman right. It is with sentiments of much regret that we part with Mr. Dalby.

We congratulate ourselves, however, on the fact that the Magazine has been fortunate in securing the services of an able successor in the person of Mr. Collingwood, whose name is no doubt familiar to many of our readers through his articles which have appeared from time to time in other technical publications.

Mr. Dalby carries with him our sincerest good wishes for success in his new line of work, and we bespeak for Mr. Collingwood that same measure of success so long enjoyed by his predecessor.

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Supplement to Car Interchange Manual.

A supplement to the Car Interchange Manual showing the latest decisions of the Arbitration Committee of the M. C. B. Association has been issued. The McConway and Torley Company, Pittsburg, Pa., manufacturers of M. C. B. couplers, Janney, Kelso and Pitt freight couplers, etc., advise that this supplement, together with their Car Interchange Manual, contains a complete epitome of all the arbitration cases to date, and that they would like to place a copy of the manual and supplement in the hands of every person who would find them useful.

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New Catalogue.

A new catalogue of practical books for practical men has just been issued by the Norman W. Henley Publishing Co., 132

Nassau street, New York, N. Y. Descriptions and prices of a large number of the latest books devoted to the trades and professions are given, among those of most interest to our readers being on such subjects as the air brake, locomotive engineering, valve gears, fuel, smoke prevention, etc., besides educational charts on the air brake, passenger, box and gondola cars, horsepower, tractive power, etc. A copy of this catalogue will be sent free to any of our readers upon request by the publishers.

* * *

Steel Postal Car in Collision.

A collision occurred on the Pennsylvania Railroad near Summer Hill, Pa., January 23d, between two sections of a passenger train. Three persons were killed and several injured. It is reported that the first section stopped on account of a broken rail. A new steel postal car was next to the locomotive of the second section and a wooden car next behind the mail car, and while the engine and the wooden car were badly smashed, practically no damage was done to the steel mail car. This is conclusive proof that steel cars will prove to be great life saving devices when railroad companies see fit to adopt the same.

* * *

Plans for Immense Locomotive Works.

Plans for one of the most complete and best equipped locomotive plants in the world are being prepared for the American Locomotive Company, to be erected on a plot of land consisting of 130 acres at Gary, Ind., which the company recently purchased, and which adjoins that of the United States Steel Corporation. The present plants of the company are located at Schenectady and Dunkirk, N. Y., Pittsburg and Scranton, Pa., Richmond, Va., Paterson, N. J., Manchester, N. H., and Montreal, Canada, the largest of which covers not more than half the extent of land as will the proposed new works. When fully occupied it is expected that from 12,000 to 15,000 workmen will be employed.

The fact that there is at present no locomotive works of any considerable size west of Pittsburg makes the selection of this site, 24 miles from Chicago—a great railroad center—and in the heart of the steel industry, particularly advantageous, offering as it does every facility for securing material for locomotive construction and providing for quick and direct delivery.

* * *

A Return to Lower Steam Pressures.

We are led to believe that the completion of an order for forty-nine locomotives for the Atchison, Topeka & Santa Fe, designed for a boiler pressure of 160 pounds marks the beginning of a return to reasonable steam pressures. These engines have increased cylinder dimensions and exert the same tractive effort as those of equal weight and higher steam pressure. The boiler troubles and lubricating difficulties which were encountered with the high-pressure engines will thus be eliminated.

It was the introduction of the compound locomotive which led to the excessive steam pressures with a view to economy, and motive power officials vied with each other until 225 pounds working pressure became frequent. It is now claimed that no economy is effected by this excessive pressure, and that the same results are obtained by enlarging the cylinders and reducing the pressure.

The Santa Fe engines are equipped with the Baldwin smokebox superheater, which utilizes the waste heat of the front end and gives a low degree of superheat. A fuel saving of from 10 to 20 per cent. has been effected where the superheater was placed in the smokebox, as whatever heat is imparted to the steam by the gases before they escape through the stack is clear gain.

The front end superheater should be a success if properly handled and the repair men realize the necessity for ordinary care, as it enables the use of lower boiler pressure with better operating results.

* * *

The F. C. Miller Automatic Drainage, Relief and Compression Valve.

An automatic drainage, relief and compression valve for locomotive cylinders which seems to have considerable merit, views of which are shown herewith, has been patented by Mr. F. C. Miller, a locomotive engineer on the New York Central lines. The following from a descriptive circular of the device will give a good idea of its operation:

This valve is compact and simple in its construction, consisting of a casing *A* (of which the abnormal valve seat is a part).

An abnormal or high pressure valve *B* with its spring *C*.

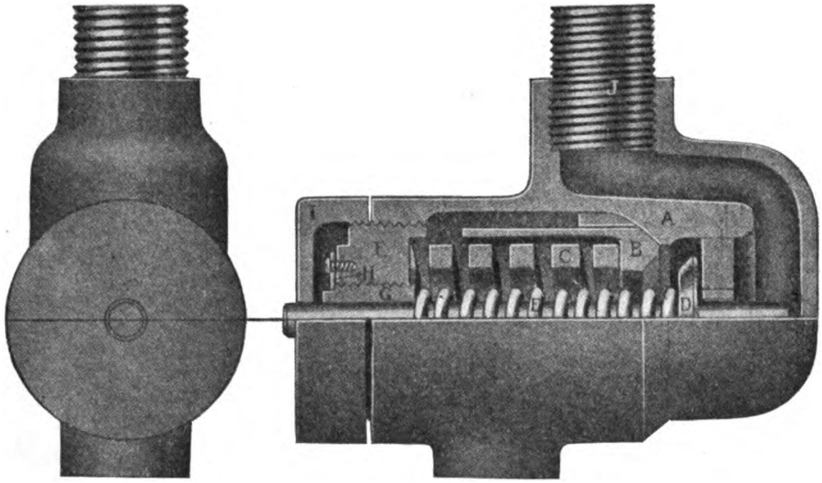
A drainage valve *D* which seats on the abnormal pressure valve.

A drainage valve spring *E*.

Abnormal and drainage valve adjusting screws *F* and *G*.

Locknut *H* and cap or cover *I*.

The normal position of valve *B* is closed, it opens only when, by flooding or other cause, the pressure on piston or cylinder heads becomes excessive.



The F. C. Miller Automatic Drainage, Relief and Compression Valve

The valve is held in its normal position by spring *C*, which is set above boiler pressure.

This valve forming seat for drainage valve *D* allows them to work as one valve in case of excessive pressure.

The normal position of drainage valve *D* is open.

This allows a clear passageway to the outlet, thereby preventing any accumulation of water in the cylinders, a great advantage to piston valve engines.

This valve is held open by spring *E*. When steam enters at the starting of engine, this valve closes. At the exhaust it opens and completely drains cylinders of all condensation.

When under a fair head of steam, compression keeps them closed. As the cause of the blowing out of heads is an excessive amount of water in the cylinders, the use of this valve makes it an impossibility to blow out a cylinder head.

It is a well-known fact by railroad men that the cylinder cocks on locomotives standing in the engine house, yards, etc., are very frequently left closed, resulting in an excessive accumulation of water, which is very detrimental to the cylinders and valves, even though a cylinder head is not blown out as a result.

With this valve opening automatically as it does when steam is shut off, the water is drained as fast as it condenses, therefore no water is worked through the valves and cylinders to cut them and wear away the oil. This in itself will save enough in valve, cylinder and piston packing, to say nothing of increased efficiency of the locomotive brought about by better lubrication and tight valves, to attract the attention of any motive power man.

While the engine is drifting the drainage valve remains open to reduce vacuum and compression, and has demonstrated unlimited merit in eliminating the strain and pound on the machinery of heavy, fast passenger engines equipped with Walschaert valve gear actuating piston valves, when shut off at a speed of 40 miles an hour and upward. The use of this valve also does away with any blowing of live steam. By simply connecting these valves with a discharge pipe underneath the engine one can be free from any vapor whatever, a fact appreciated by all engineers, especially in cold weather.

Further information may be had by addressing Mr. F. C. Miller, 23 Houghton street, Worcester, Mass.

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Lubricating the Motor.

A very handsome booklet, about five inches by eight inches, has recently been gotten out by the Joseph Dixon Crucible Company, Jersey City, N. J. It is entitled "Lubricating the Motor," and as its name indicates, deals with the subject of lubrication of automobiles, motor boats and motor cycles.

The booklet is divided into chapters which deal with the individual part of motor mechanism: cylinders, transmissions, bearings, etc. There is a chapter on tires which includes some valuable hints on this rather sensitive part of the vehicle. There are also special chapters entitled "Overhauling the Car" and "Motor Boat and Cycle," which are self-descriptive.

The booklet opens with a brief treatment of flake graphite lubrication. A good point is developed concerning the peculiar advantage of flake graphite when combined with oil or grease, due to the lack of sensitiveness of flake graphite as compared with oil or grease. We quote:

"Oil or grease are probably the best known reducers of friction, but they are too sensitive—their range of highest efficiency is extremely narrow. As conditions rise above or fall below, those which are normal for any given oil or grease, its efficiency drops rapidly. Too high a temperature thins the lubricant and so weakens it that it cannot support its load; excessive heat disintegrates both oil and grease. If the temperature is too low the lubricant feeds too slowly or exerts a retarding force because of its great viscosity. Speed and pressure are important factors—no one oil or grease can well adapt itself to wide demands in either particular.

"How different is flake graphite; always the same under all conditions. Heat does not diminish its efficiency, nor does cold make it sluggish. Pressure does not squeeze it from the bearings and it is indifferent alike to high speed or low. Even acids and alkalies cannot affect it.

"The motor car or motor cycle is exposed to wide variations in temperature, it must travel rough roads as well as smooth, it runs both slow and fast, its demands for power are from light on the level stretch, to heavy on the steep grade.

"And to meet this wide range of running conditions, there is nothing equal to Dixon's Flake Graphite. A diminisher of friction and wear, a preventive of cutting and seizing, a guard against rust and corrosion."

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*The New Electric Tube Railway in London.**

There has recently been placed in operation one of the most important of London's electric tube railways, the Great Northern, Piccadilly and Brompton Railway, which is reached by nearly all the important lines in and through that city.

The Great Northern, Piccadilly and Brompton Railway is a combination of the Underground Electric Railways Company of London, Ltd., and the Baker Street and Waterloo railways, the enterprise not only including forty-four miles of single tunnel, but also nearly as many miles of the Metropolitan District Railway, and even a greater number of miles of the London United Tramways, or about 130 miles in all, as well as the great Chelsea electric power generating station, the total capital being about $120,000,000.

In Figs. 1 and 2 may be seen the electric hoisting power equipment of the underground railway station for carrying the passengers to and from the cars by elevators. Figs. 3 and 4 show interior and exterior views of the underground cars and the making up of the electric tube railway trains.

The electric current for operating this underground tube electric railway is generated at the Chelsea power station at Lots Road, which was erected by the Underground Electric Railway Company, limited, of London, and is equipped with steam turbines having a total capacity of more than 60,000 horsepower.

In this station there are eight turbo-alternators, each having a capacity of 7,500 horsepower. These steam turbines are of the Parsons horizontal type, oper-

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*By Frank C. Perkins.

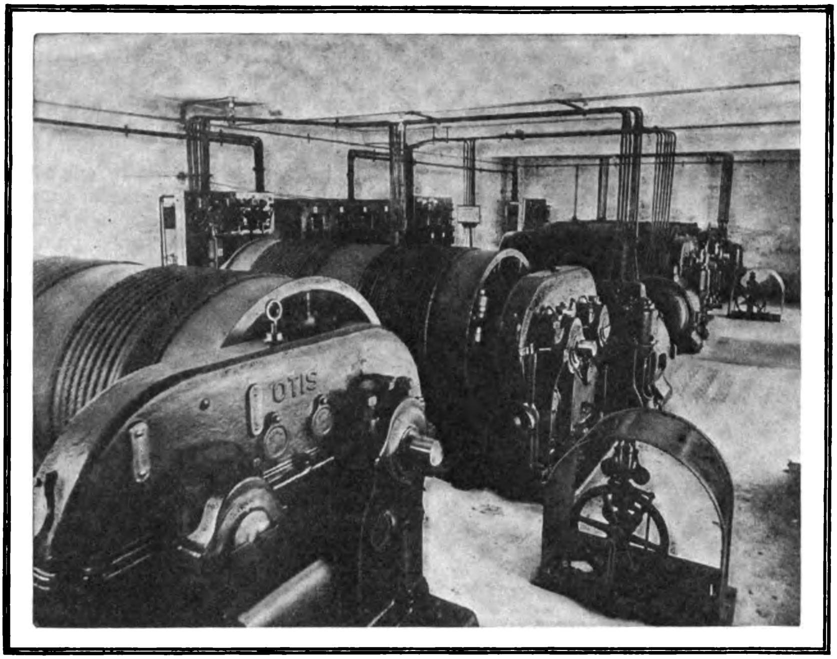

Fig. 1. ELECTRIC WINDING GEAR FOR THE PASSENGER ELEVATORS OF THE LONDON UNDERGROUND RAILWAY

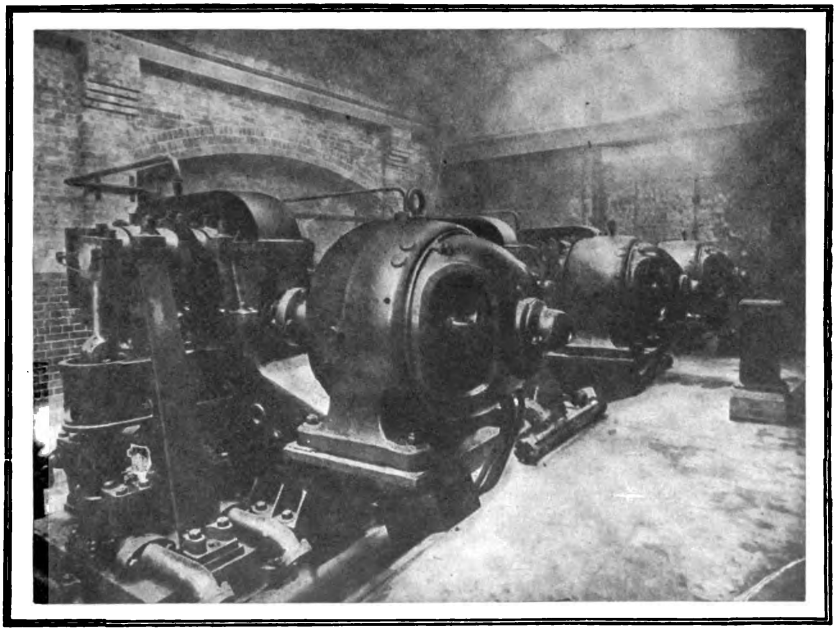

Fig. 2. ELECTRICALLY OPERATED PUMPS FOR THE HYDRAULIC LIFTS OF THE LONDON UNDERGROUND PASSENGER STATIONS

ating at a speed of 1,000 revolutions per minute. The electrical generators directly connected with these steam turbines supply a polyphase current having a pressure of 11,000 volts, this current being conducted through underground cables to the various electric sub-stations equipped with step-down transformers and rotary converters for changing the current in character from an alternating to a continuous current, the pressure being reduced from 11,000 volts to 550 volts for use on the third rail. From this station the current is conducted to the sub-stations of the district railways, as well as the three-tube underground electric roads. For lighting the stations and tunnels, as well as for operating the passenger elevator and driving the ventilator fan, the same source of electric supply is utilized, the automatic signaling apparatus being worked also by this power.

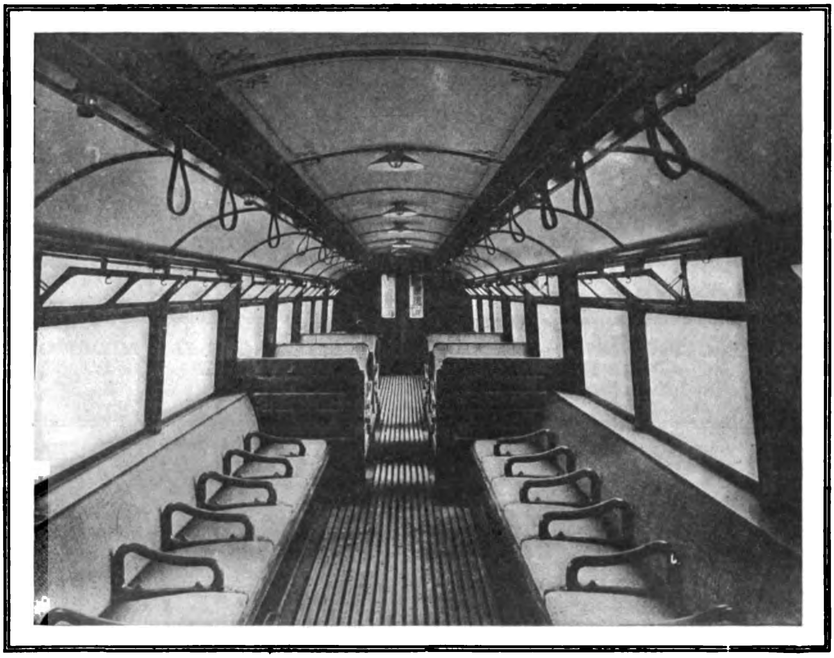

Fig. 3. INTERIOR OF COACH, LONDON'S UNDERGROUND ELECTRIC TUBE RAILWAY

The stations are lighted by arc lamps fed from the electric elevator circuit. There are also a number of incandescent lamps in the station supplied with current from the same circuit as the tunnel lamps, and as a further precaution against interruption in the lighting service there is another set of station lamps operated from the supply circuits of the local electric lighting company, and all of the three systems are continually in service.

There are a score of exhaust fans being utilized in the ventilation of the tunnel, which are installed in the understations in various parts of the city, a total of 21,000,000 cubic feet of air per hour being drawn from the tunnel, while the same amount of fresh air rushes in through the staircase and the elevator shafts at the stations where the exhaust fans are located. It is claimed that no musty smell can be detected in any of the tunnels, the fresh air being mixed thoroughly with the air in the tunnels by the trains as they pass continually.

The walls of the station are of white and green enameled tiles in the booking hall, the station buildings being extremely handsome and faced with ruby-colored glazed blocks arranged in series of large arcs. Each of these buildings has a mazzanine floor with a flat roof and a ground floor, the upper stories being added as

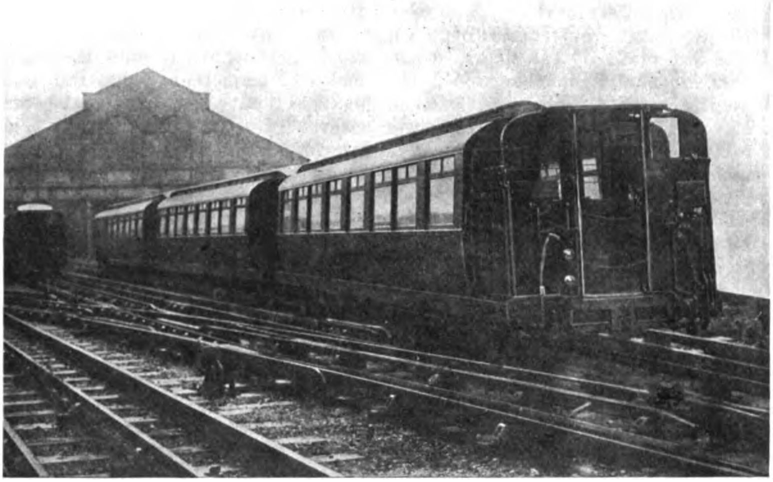

Fig. 4. ELECTRIC TRAIN ON LONDON'S NEW UNDERGROUND TUBE RAILWAY

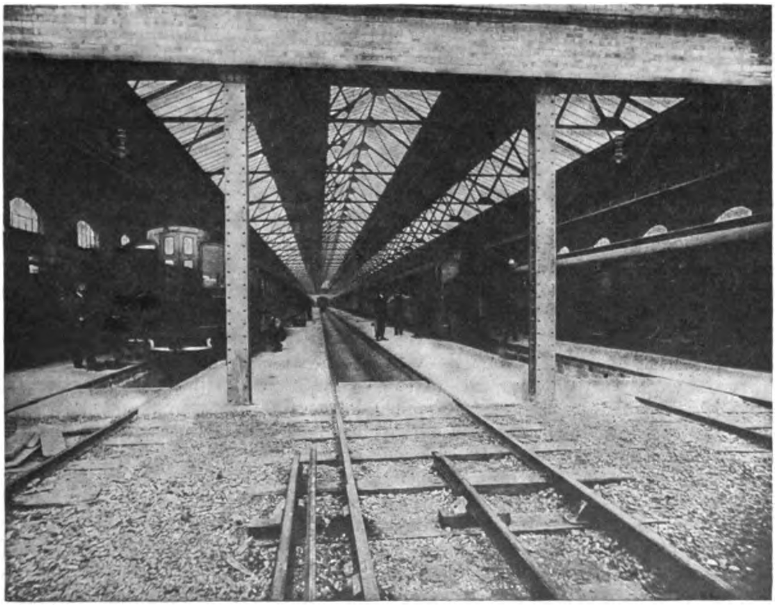

Fig. 5. ELECTRIC TRAINS IN CAR SHEDS OF LONDON'S NEW ELECTRIC TUBE RAILWAY

found necessary. There are nineteen stations in all, with sixty-four passenger elevators operated electrically by motor-driven hoisting gear and equipped with very elaborate safety devices. The electric elevators are constructed of steel, with the exception of the floors, which are made of noninflammable wood, and each carries seventy passengers per trip, who leave the elevator from the opposite side to that which they enter. There is a considerable saving of time with this construction, the exit gates being closed and opened by compressed air. At the Finsburg Park station there are four hydraulic elevators, while at the Holloway station there is a double spiral passenger conveyor in addition to the electric elevators, this device, which is a most interesting novelty, being kept in continual operation at a speed of 100 feet per minute. By the use of the double spiral conveyor the passengers can descend at the same time others are ascending, therefore the capacity is very great,.the traveler simply stepping on the continuous gangway and being conveyed to the top or bottom as desired. Emergency stairs are also installed at each of the stations for use in case of accident to the electric elevators.

There are 72 motor cars with about 150 trailers utilized on the Great Northern, Piccadilly and Brompton Railway. All of these coaches are constructed of steel and are therefore absolutely fireproof, the mahogany paneling inside being only a thin veneer and mounted on asbestos slates, the wood being chemically treated so as to be noninflammable, while the rattan seating is also treated in the same manner.

These electric tube cars carry about fifty passengers each, and each car is equipped with two 250-horsepower motors, the trains being controlled by the multiple unit system.

By this arrangement, which is well known, the motors on the rear cars of the train are controlled by the same agency as controls those on the front car, where the motorman is stationed, and the lever is so arranged that if anything happens to the attendant, causing him to relax his hold, the train stops, insuring safety to the passengers and train.

The cars are equipped with Westinghouse air brakes, and the signaling system provided is very elaborate, the arrangement being such that in case a motorman overruns a signal at danger, a short arm standing up alongside the track strikes an air cock on the passing train, and in this manner applies the brake. When the signal is clear this automatic drop is lowered out of the way. By this electric-pneumatic automatic signaling system every train sets each signal to danger behind it, and the signal remains at danger until the train is at the next section, when the signal returns to clear. There are semi-automatic signals provided at interlockings and also points at crossovers controlled from frames in signal cabinets.

There is also a most interesting and ingenious set of illuminated track diagrams provided, which show at a glance what sections of the railway in the neighborhood are occupied by trains. On these diagrams the occupied sections are dark, while those unoccupied are illuminated, as the little electric lamps behind the diagram light up or go out in unison with the signals on the line.

* * *

*Articulated Compound Locomotives.**

The constantly increasing demand for heavier power, made by most railways in the country during the last decade, and especially by those roads having heavy gradients combined with sharp curves, brought out various designs which on account of rail pressure limitations required so many coupled wheels that the length of the rigid wheel base made them unwieldy to operate with efficiency. This demand for greater power was, of course, greatest in mountain districts where heavy grades and sharp curvatures generally go together, necessitating for safe operation comparatively short wheel bases, reduction in engine resistance and wear of wheel flanges and rail, together with moderate weight of the working parts of the engine.

In striving to meet this demand the locomotive designers and builders were brought face to face with an unsurmountable barrier to further progress in the enlargement of engines on the old lines; and in 1902 the American Locomotive Company decided to work out a design of a heavy, powerful locomotive for the Baltimore and Ohio Railroad, having two sets of engines under one boiler, capable of adjusting themselves independently to the alignment of roads with curvatures up to 30 degrees on the principle developed by the prominent French engineer, M. Anatole Mallet, of Paris.

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*Paper by C. J. Mellin, American Locomotive Co., Schenectady, N. Y., presented at the December, 1908, meeting of the American Society of Mechanical Engineers.

Mr. Loree, then president of the Baltimore and Ohio Railroad, considered the question seriously; but it was first thought that it would be of no advantage to the Baltimore and Ohio Railroad, even if it proved successful, and the subject was left undecided for some time. In the latter part of 1903, on the recommendation of J. E. Muhlfeld, who in the meantime had become general superintendent of motive power of the Baltimore and Ohio, ordered one engine of this type, which was built at the Schenectady works of the American Locomotive Company during the winter of 1903 and 1904, to suit the conditions of that railway.

Propositions for building the Mallet type of engine had been made both by S. M. Vauclain, general manager of the Baldwin Locomotive Works, and by the writer several years prior to the above date, but the one under consideration is, so far as the writer is aware, the first engine of this type completely designed and built in the United States. The original Mallet type of engines built in Europe dates back to the early nineties, but its history would be too extended to embody in this paper.

This Baltimore and Ohio locomotive, which was of unusual dimensions for that time, was exhibited at the Louisiana Purchase Exposition at St. Louis in 1904. A great number of locomotives of this type, of various sizes, have since been built for other roads as forerunners of what promises to be the most powerful and efficient type of the freight engine of the future. The form permits of the application of cylinders of largest dimensions, as well as of the largest boiler capacity, by the distribution of the weight over a long wheel base and over many driving axles. Up to the present date a tractive power of about 125,000 pounds has been reached, whereas the ordinary types of engines rarely exceed 44,000 pounds.

The tractive power P is figured by the usual formula for multiple expansion engines working compound, namely:

$$P = \frac{d_L^2\, p\, C\, s}{D}$$

in which d_L = Diameter low pressure cylinder.
p = Boiler pressure.
s = Stroke of piston.
D = Diameter driving wheels.
C = Coefficient obtained from actual practice, and varying with the degree of cut-off and cylinder ratio.

The cylinder ratio being as a rule 1 to 2½, and the cut-off in the high-pressure cylinder about 82 per cent., the value of coefficient C is about 0.53 at a piston speed not exceeding 250 feet per minute.

Table 1.—Comparison of Principal Dimensions and Weights of Individual Parts of Heaviest Mallet Engine and Heaviest Designs of Ordinary Types.

Road.	Erie.	D. & H.	P. B. & L. E.	A. T. & S. F.	A. T. & S. F.	B.R.&P.
Builder	A. L. Co.	A. L. Co.	A. L. Co.	A. L. Co.	Baldwin	A. L. Co.
Type	Artcltd. 0660	Consol. 280	Consol. 280	Decpd. 2100	Decpd. 2100	Decpd. 2100
Simple or comp. cyls	Comp.[1]	Simple	Simple	Comp.[2]	Comp.[2]	Simple
Diam. and stroke in.	25&39x28	23x30	24x32	17½&30x34	19&32x32	24x28
Boiler pressure, lb.	215	210	210	225	210	210
Diam. driving wheels, in.	51	57	54	57	57	52
Tractive power, lb.	94,800	49,690	60,900	55,300	62,500*	55,350
T. P. working simple	120,000	-----	-----	68,000	64,100	-----
Total weight	410.000	246,500	250,500	259,300	266.600	268,000
Weight on drivers, lb.	410,000	217.500	225.500	232,000	237.000	243,000
Factor of adhesion	4.33	4.38	3.7	4.20	3.82	4.39
Rigid wheel base	14′ 3″	17′	15′ 7″	20′	20′ 4″	19′
Av. load per wheel on rail, lb.	25,625	27,200	28,200	23,200	23,700	24,300
Weight—						
Main rod, lb.	968	985	1,144	817	1,028	1,050
Inter. rod, lb.	406	681	424	574	-----	449
Front rod, lb.	133	188	260	158	-----	187
Back rod, lb.	135	208	200	158	-----	190
Back inter. rod, lb.	-----	-----	-----	244	-----	190
H. p. piston and rod, lb.	790	782	693	1,130	1,075	830
L.p. piston and rod, lb.	993	-----	-----	1,130	1,075	-----

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[1] 4 cyl. articulated.

[2] 4 cyl. tandem.

*Calculated by the formula used by the Baldwin Locomotive Works for figuring the tractive power of 4-cylinder tandem compound locomotives.

For working single expansion the formula will be that of a simple engine multiplied by 2 or

$$p^1 = \frac{2\, d^2\, p\, C\, s}{D}$$

where the symbols are the same, except *d*, which represents the diameter of the high-pressure cylinder, and the value of *C* equals 0.85, which is accepted for simple engines.

The factor 2 is used on the basis that the low-pressure engine develops the same power as the high-pressure, because the steam supply to the former is reduced in an inverse proportion to the cylinder ratio.

Table 2.—Comparison of Principal Dimensions and Weights of Individual Parts of Mallet Engine and Designs of Ordinary Types of Freight Engines Having Approximately Similar Tractive Power.

Road.	Central Ry. of Brazil.	N. Y. C. Lines.	Erie.
Builder	A. L. Co.	A. L. Co.	A. L. Co.
Type	Articulated. 0660	Consol. 280	Consol. 280
Simple or compound	Compound*	Simple	Simple
Cylinders diam. and stroke, in.	17½, 28x26	23x32	22x32
Boiler pressure, lb.	200	200	200
Diameter of driving wheels, in.	50	63	62
Tractive power, lb.	42,420	45,700	42,500
Tractive power working simple, lb.	52,000	------	------
Weight on drivers, lb.	206,000	208,000	179,000
Total weight, lb.	206,000	234,000	202,000
Factor of adhesion	4.85	4.5	4.2
Rigid wheel base	9′	17′ 6″	17′
Average load per wheel on rail, lb.	17,166	26,000	22,375
Weight of main rod, lb.	417	821	848
" inter. rod, lb.	----	403	509
" front rod, lb.	208	185	246
" back rod, lb.	92	201	210
Weight of h. p. piston and rod, lb.	297	664	516
" l. p. piston and rod, lb.	459	----	----

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*4 cyl. articulated.

The Mallet articulated arrangement presents the advantage of making it possible at the very first to provide an engine under the control and operation of a single crew, having double the power of the largest engines of the ordinary type.

These advantages are most clearly evidenced by the comparisons in Table 1 between the heaviest engine of the Mallet type ever built and some of the heaviest freight engines of standard types.

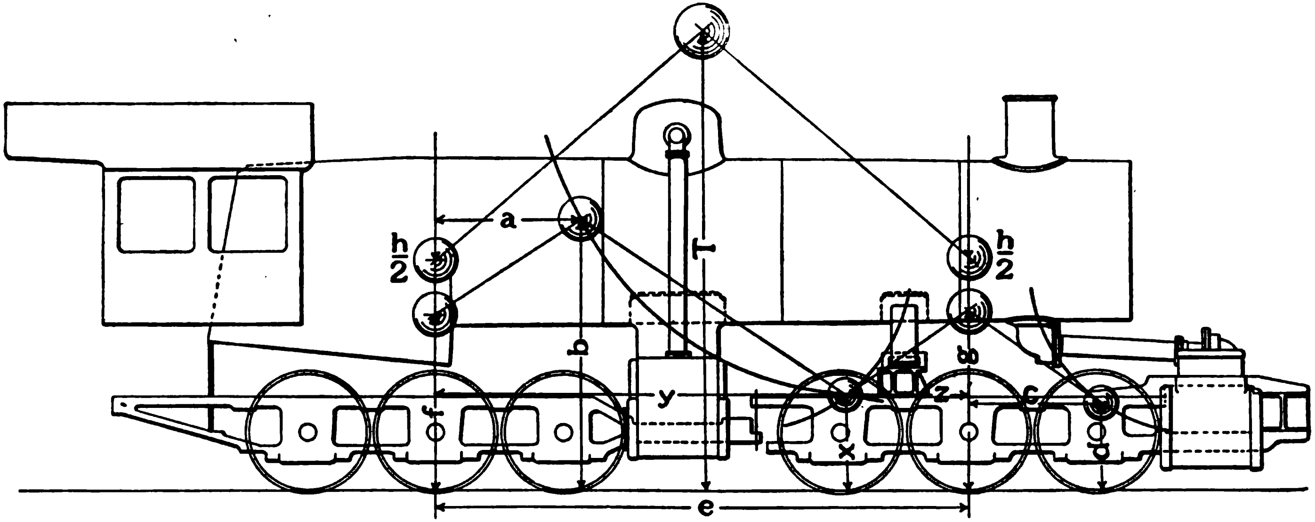
The comparison in Table 2, however, between one of the lighter designs of Mallet engines and a few engines of the ordinary types, of approximately the same power, clearly shows that the same tractive power is obtained with this type as in other types, but with weights of moving and wearing parts equivalent to those of an engine of half the tractive power.

In general, the Mallet articulated locomotive consists of a front system with its frame work, low-pressure cylinders with their attachment of guides and rods, one set of driving wheels, cross-ties and boiler supports; and a rear system with the high-pressure cylinders and frame work, fixed to the boiler as though an ordinary engine were placed under the rear part of the boiler.

The supporting points are of course in the center of their respective wheel bases; and are preferably used as the reference centers for calculating the moments of the individual systems.

It will be seen from Fig. 1 that, when the proper weights have been arrived at as a whole, the weight of each system with its center of gravity must be figured out independently, starting with the front system in which the center of gravity falls well ahead of its center of support. As the rear system is by far the heavier, the front system must therefore carry one-half of the difference between the two to divide the weight equally. The point where this weight is to be supported on the front system is readily located by finding the required lever arm to obtain the same moments in the rear of the center of the wheel base as those in front of it. This center may be called the virtual supporting point of the rear system on the front engine.

The weight on this point, multiplied by its distance from the center of the wheel base of the rear system, gives the moment for this system. By dividing the weight of the rear system into this moment, we find the distance from the wheel base center of that system at which its center of gravity must be located; as is graphically shown, with all moment



$$a \times b = y \times x \quad c \times d = z \times x \quad (a \times b) + (c \times d) = e \times x$$

$$x = \frac{(a \times b) + (c \times d)}{e}$$

$$f = b - x \quad f = g \quad x = d \quad g = d + x \quad h = \text{dead weights}$$

$$f + \frac{h}{2} + g + \frac{h}{2} = T$$

Fig. 1. Weight Distribution of Articulated Locomotive

curves in both systems, in Fig. 1. The balls in the figure represent the various weights so far as they effect the distribution, and their relative value is represented by their height from the base line. It is not necessary to include wheels, axles and boxes or what are termed dead weight in this method of calculation, because they are all central over the supporting points; and, as shown in the figure, are added after the distribution of the live weight is ascertained. In Fig. 1 the curve to the right of the front wheel base center is the moment curve of that system. This curve is reproduced on the left of the center and will pass through the point where one-half of the distance between the two systems will balance that of the front system. Starting from this point, and with reference to the rear wheel base center, we get the moment curve for the rear system which passes through the center of gravity of that system where it intersects the level from the common base line, representing its total weight. All the moment curves are, of course, true hyperbolæ, and are therefore easy to construct. An approximate plan is laid out and modified until the desired total weight is obtained; and, if the center of gravity of the rear system does not coincide with this calculation of distribution, it is generally most convenient to shift the location of the boiler in the required direction until that occurs; or, if preferred, the framing and heavier castings in front and rear of the center of gravity may be modified to produce the same effect.

The support of the rear system on the front engine, shown in Fig. 2, must be capable of sliding laterally to allow the front engine to enter a curve and form an angle with the rear engine. For this reason the two engines are hinged together by vertical swivel pins located, preferably, slightly ahead of a point midway between the two wheel sets, because the swivel point being so located aids the guiding of the rear engine into curves on account of its closer proximity to the center line of the track when the engine is going ahead. A lateral spring applied in the front part of the leading engine permits an elastic yielding of that engine into a curve and restores alignment in leaving it (Fig. 3).

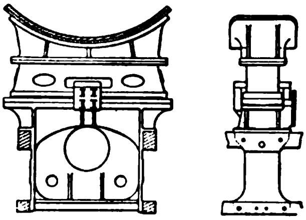


Fig. 2. Main Boiler Bearing

It is not practical, however, to place the sliding support on the virtual location previously mentioned; because the front engine would then be unstable and tip one way or the other, like a scale beam, with the slightest disturbance due to change of weight on grades, but it should be on a convenient location in front of the virtual one. This, of course, would allow the front engine to tip forward as the imposed weight on that point would be less and the arm from the driving wheel base center shorter. To correct this disturbance, a pair of vertical hanger bolts are applied between the upper member of the frame at the extreme rear

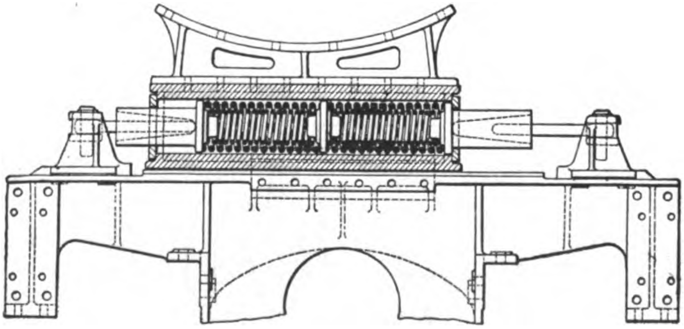


Fig. 3. Spring Centering Device

end of the front engine and the lower member at the extreme front end of the rear frame (Fig. 4); or two supports may be provided, one on each side of the virtual supporting point. With these bolts or hangers the proper alignment of the front engine may be adjusted at will, and the effect of the combined supports is restored to the virtual supporting point. This method reduces the pressure on the sliding plate and imposes load on the bolts in proportion to the respective distances of the two supports from the virtual supporting center.

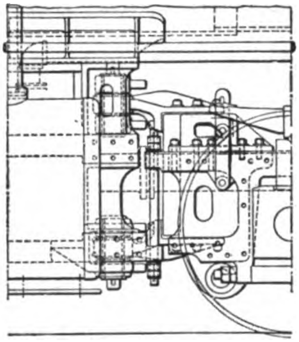


Fig. 4. Vertical Hanger Bolts

It is evident that the supporting bearing must be self-adjusting to bear evenly at all alignments of the engine. To accomplish this the lower, or what we may call the pillow plate, has a ground surface on its upper side on which a corresponding upper plate can slide with the movement of the boiler; while its under side is slightly curved to allow a longitudinal rocking. This pillow plate is held in position by means of two dowel pins about 2 inches in diameter recessed about ¾ inch into the plate and an equal amount down into the cross-tie on which it rests approximately in the middle of the convex or curved part. In this way the pillow plate is kept in position without destroying its ability to adjust itself so as to present a uniform bearing for the upper or sliding plate at any alignment of the engine, Fig. 2.

The front engine thus becomes a very efficient leading truck for the rear engine. Opinions on the use of a truck in the articulated engine are, however, divided; but, because of the many objections connected with the application of a front truck in freight service as to the first cost, maintenance, dead weight and unfavorable distribution of the machinery sometimes causing serious obstructions, nothing is gained by this objectionable feature; as it is practically the same as putting a truck ahead of a truck.

The front engine in going ahead being a truck in itself, the first pair of drivers have a leverage in their favor in entering the curve. The reason for this is that the virtual support of the weight of the rear system, which is carried by the front, falls back on the latter and in the rear of the sliding bearing, thus allowing a great part of the load of the rear engine to be carried by the hanger bolts (Fig. 4) between the two frames.

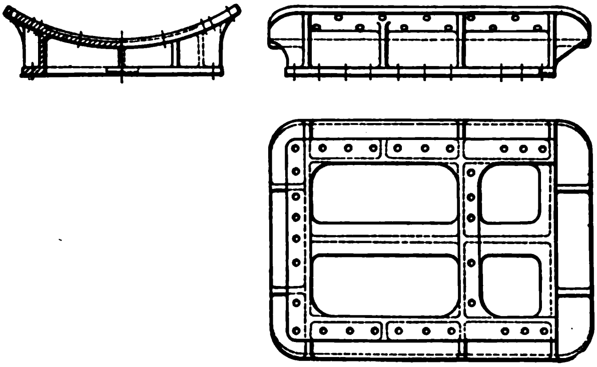


Fig. 5. Boiler Saddle

This alone reduces the pressure very materially on the sliding plate, which, together with the short arm for friction resistance and long guiding arm for the flanges, reduces the pressure on them to a small fraction of the total friction load on the sliding plate; and comparatively light centering springs will therefore suffice for this purpose and still further reduce the flange pressure.

These same leverages and resistances act equally favorably in backing; as it is simply a reversed operation and the rear drivers have to swing the boiler against these resistances. Therefore, it is important that these should be small and with the shortest possible leverages, which naturally also minimizes the flange pressure on the rear wheel; that is, the last wheel of the engine, which then has to do the guiding.

With the use of a front truck, the center of support is shifted forward and with it the virtual and actual supporting points of the weight of the rear engine carried on the front system. The weight on this support must, therefore, be increased with the carrying capacity of the truck and offer little or no opportunity for transferring any of this load to the hanger bolts, practically doubling both the load on the sliding plate and the length of the resistance arm. At the same time, by the application of a front truck, the guiding point is moved forward so that the leverage has been increased to offset the increased side resistance of the engine. The guiding power of the truck, however, is limited to its swing resistance. This, therefore, may leave as much or more guiding to be done by the front drivers as where no truck is used because of the increased moments of resistance of the engine in curving.

A more serious matter, however, is the backing with a front truck. The high resistance moments in the front must be overcome by the rear drivers, which are doing the guiding, and it is easy to understand how fast the flange pressure is multiplied by this displacement of the load and the safety margin for derailing dangerously reduced. It is therefore evident that a rear truck is a necessity when a front truck is used where backing is to be considered; thus curing one evil with another. Even with the application of a rear truck, the objections caused by the application of the front truck will be only partly compensated for, as the following very essential objections still remain:

a. The application of a front truck increases the distance of the front buffers from the first pair of drivers by 15 to 20 per cent., and consequently throws the front drawhead of the engine further out from the center of the track in curves than with the shorter extensions where no front truck is used.

b. It increases the total wheel base of the engine about 8 feet 6 inches, requiring an 80-foot turntable to take an average sized engine with its tender.

c. Additional dead weight to be carried by the truck must be provided and the expenses in maintenance and first cost by the use of it are items that should not be overlooked.

d. The long arms for friction resistances on the sliding plate with increased load on them, due to the front truck, will not be lessened by the application of a rear truck.

e. When only a front truck is applied, the boiler is necessarily moved so far forward that it leaves scant room for the valve motion on the rear engine. The result of this is that the width of the firebox is necessarily limited to about 72 inches.

In the case of passenger engines of the articulated type, however, large wheels would be used, and only four pairs of drivers can or need be applied. A four-wheel front truck, with rigid center pin and rigid trailing wheels, work in conveniently in the place of a third pair of drivers in each engine front and rear, respectively; which otherwise, with their large diameter, make the engine unduly long.

Continuing with the construction of an engine without a truck, the spring rigging and equalization are next to be taken into consideration. The springs are most conveniently located above the boxes and frame, except under the firebox, where they must be placed between the adjacent wheels with yokes over the boxes in the usual manner. On the front engine, all springs on each side are equalized together with a cross-equalizer between the front springs. The rear engine is equalized in the same manner, except that the cross-equalizer is omitted. This makes a three-point suspension of the whole engine and prevents any excessive local stresses of a diagonal nature on an uneven road, as the front engine accommodates itself very freely to the rear engine and approximately divides the angularity between the inclination of the axles. The wheels then follow the rail comparatively freely and easily on the twisting parts; at the rising of the outer rail, on

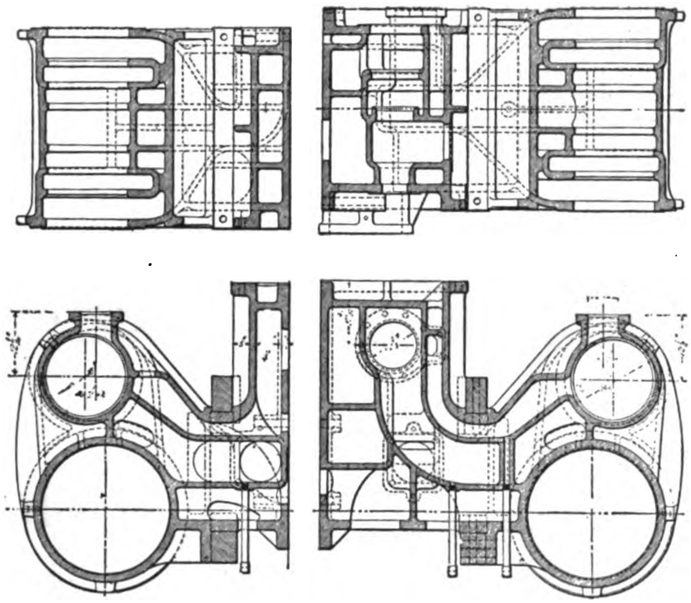


Fig. 6. Cross-Sections of Right and Left Hand High Pressure Cylinders

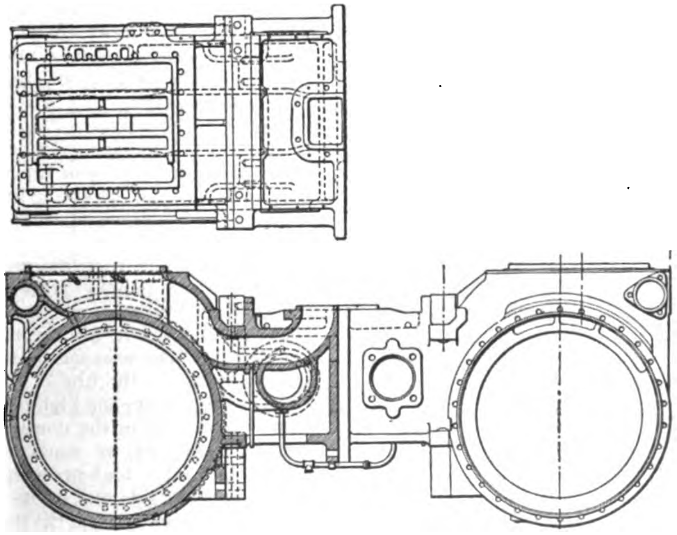


Fig. 7. Cross-Section, Front and Plan Views of Low Pressure Cylinders

entering and leaving curves, as well as on any other unevenness of the road.

The high-pressure cylinders, as previously stated, are located under the cylindrical part of the boiler, generally slightly in the rear of the middle of the barrel. They are provided with a cast steel saddle, bolted or riveted to the shell of the boiler by its upper flange and to the cylinder half saddle by its lower flange as shown in Fig. 5. The cylinder saddles, however, are not divided in the center of the engine; but sufficiently to one side to allow the receiver pipe with its ball joint to be placed in the center line of the engine (Fig. 6).

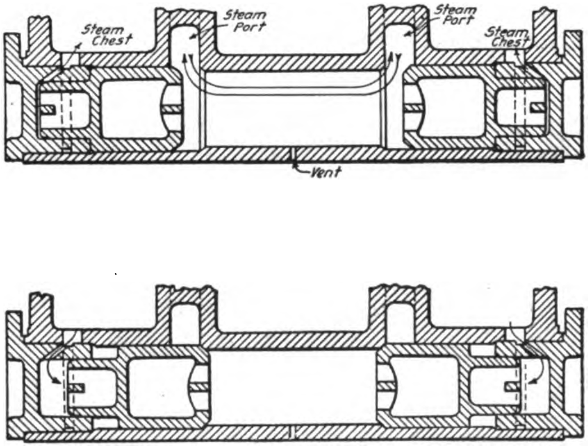


Fig. 8. By-Pass Valves

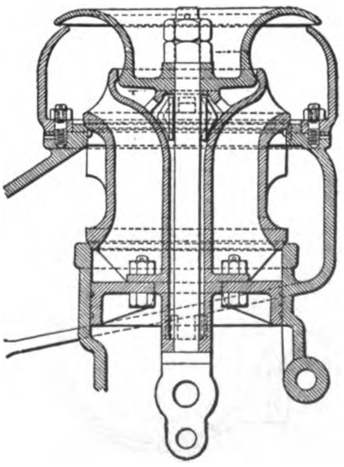


Fig. 9. Throttle

The low-pressure cylinders, Fig. 7, are fixed to the front engine with so-called "half saddles" but not connected to the boiler, except by the flexible exhaust pipe. With the large low-pressure cylinders required for the desired power, there will naturally be considerable suction of cold air through the cylinders in running with the steam shut off; which is very objectionable for several reasons, one of which is the sudden cooling of the cylinder walls and passages. To obviate this, a pair of by-pass valves (Fig. 8) are located in the cylinder castings. These valves automatically open communication between both ends of the cylinder when the throttle is closed, so that a certain amount of air can circulate through this passage to and fro with the movement of the piston, and thereby prevent the sudden changes in the temperature and relieve the pumping of air through the exhaust nozzle, and also minimize unnecessary agitation by the fire.

The steam enters the high-pressure cylinders directly from the dome, where the throttle is located, as usual, and it exhausts into the high-pressure cylinder saddles on each side and meets at a point where the steam enters the intercepting valve. After passing through into the receiver pipe placed in the center of the front engine at a convenient height above the axles, it branches off through a "Y" pipe to each of the low-pressure cylinder saddles and through passages in these saddles to the steam chest. The exhaust from the low-pressure cylinders returns through the saddles and meets in a pipe delivering to the common exhaust pipe and the stack.

In order to obtain high efficiency and emergency power, various special details that may be of interest have been brought into use in these designs.

is abruptly arrested allows no chance for the water particles, once brought into contact with the curved wall of the crown, to escape the trap. The steam in relieving itself from the moisture makes the turn into the valve opening directly at the top and through the valve body to the lower opening, as will be seen from the cut.

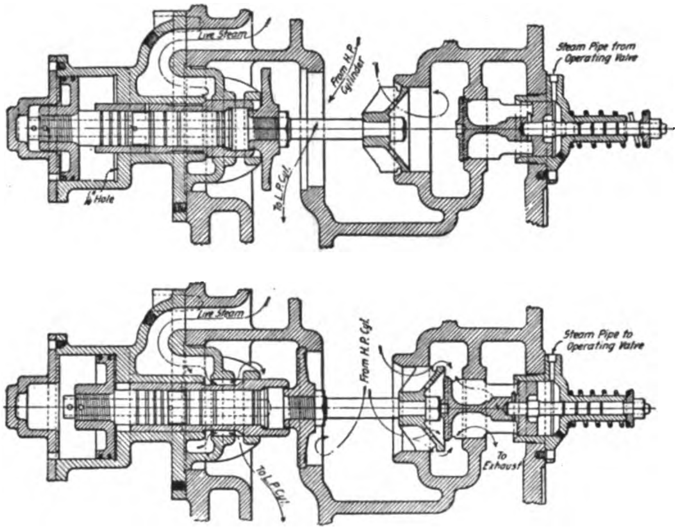


Fig. 10. Intercepting Valve

The throttle shown in Fig. 9 is provided with a steam separator at the extreme top, where the steam enters in an upward direction: and, after entering, meets a sharp turn downward whereby the entrained water is thrown against the curved walls of the crown, is entrapped at its base and forced down through the central passage back to the boiler by the inertia exerted in the trap. The continuous current of moisture that

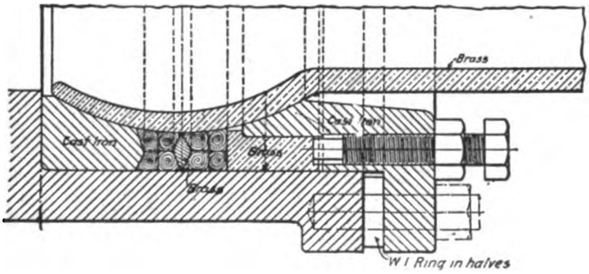


Fig. 11. Receiver Pipe Ball Joint

Following the course of the steam, we do not meet any unusual construction of the passages until we reach the intercepting valve which, although not specially designed for this engine, should be considered in this connection as a most important factor; as it controls the pressure for the receiver and low-pressure cylinders, supplies steam direct from the boiler at a proportional pressure to the large cylinders in starting, prevents this

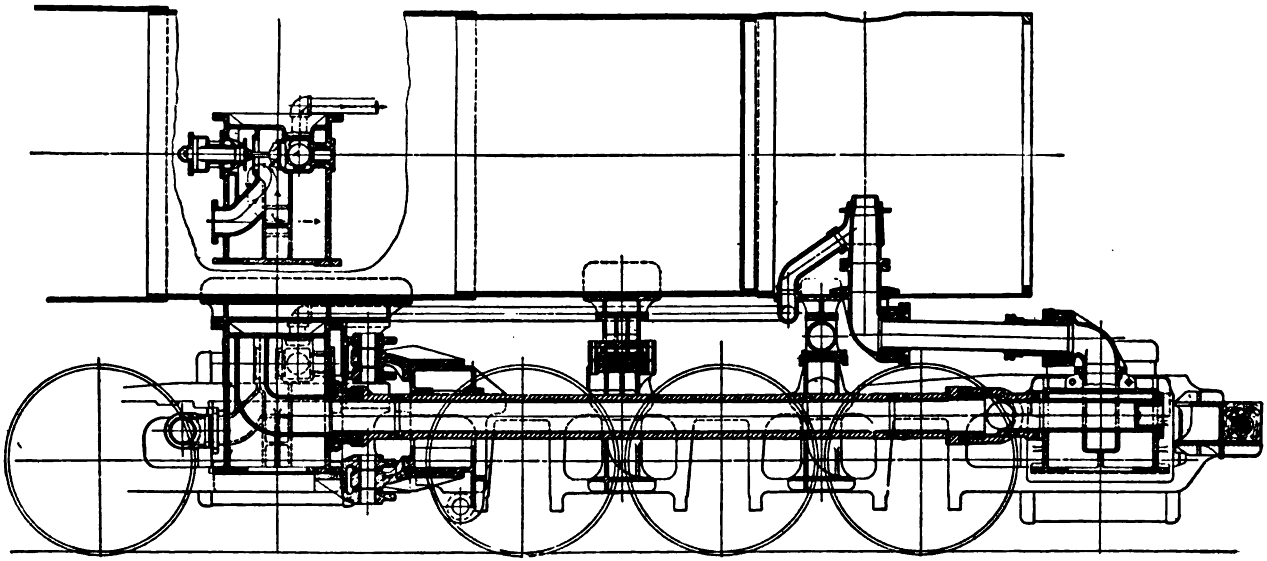


Fig. 12. Central Longitudinal Section from High Pressure to Low Pressure Cylinder, showing Steam Pipes

pressure backing up against the high-pressure piston and makes it possible to increase the power of the engine about 20 per cent. at critical moments by permitting the engine to be changed in such emergencies so as to work live steam in all cylinders with equivalent distribution of the work. With the exception of changing the engine into simple while under way, all its movements are automatic (Fig. 10).

The intercepting valve consists principally of two valves intimately combined; the one effecting the closing of the other, and a change valve by which the former is unbalanced in turning the engine into simple working when under way. The main valve closes the receiver and prevents the reduced live steam pressure from backing up against the high-pressure piston in starting and working simple, and by closing the exhaust valve the accumulation of exhaust from the high-pressure cylinders automatically opens the main valve to the low pressure side of the receivers and simultaneously closes the admission and reducing valve, whereby the engine is changed into compound.

The live steam admission and reducing valve has the form of a sleeve placed on the stem of the main valve; and, as seen in the cut, is allowed a limited longitudinal play to perform its double function.

The third, or change valve, has two functions to perform and is operated by the engineman in emergencies; and is, therefore, known as the emergency valve. Its use is resorted to only when the engine is about to stall on a heavy grade or at a difficult starting place. The first function of this valve is to unbalance the intercepting and reducing valves so that the former cuts off the low-pressure side of the receiver; and the second function is that of an outlet valve for high-pressure cylinder exhaust steam in working simple, which later is led in an independent pipe to the stack.

The next features of importance are the ball joints in the receiver and exhaust pipes which are peculiar to this type of engine. They consist (Fig. 11) of ball bearings, gland and packing. The latter is made of eight ½ inch square rings of vulcabeston or fibrous packings laid, in pairs, in the middle of which a brass ring of an elongated diamond section is inserted. Being just the width of the packing space, this ring seals all joints in the packing rings proper and forces them tightly against the inside of the box and against the ball. The receiver pipe, with the ball joint and its location, and the exhaust pipe are shown in Fig. 12.

The flexible exhaust pipe has two ball joints and one slip joint; as it is subject to a greater angle of deflection and elongation than the receiver pipe, which has its ball joint in the vertical center line of the pivot pin between the two sets of engines.

The valve motion in each set of engines is of the Walschaerts type, driven by their respective main axles and crossheads and operated with a common reversing gear which simultaneously changes the motions of all the valves. Because of the lateral motion of the front engine in curving, means must be provided for flexibility in the operating gear so that this movement does not interfere with the motion of the valves. This is accomplished by using an exceptionally long lifting link, shown in Fig. 13, having a double jaw in its upper end and a universal joint or ball bearing at the radius bar, which allows its lower end to follow the movement of the engine transversely relatively to the rear engine, as well as the longitudinal movement of the valve in any angularity of the engine within the required limit of the swing.

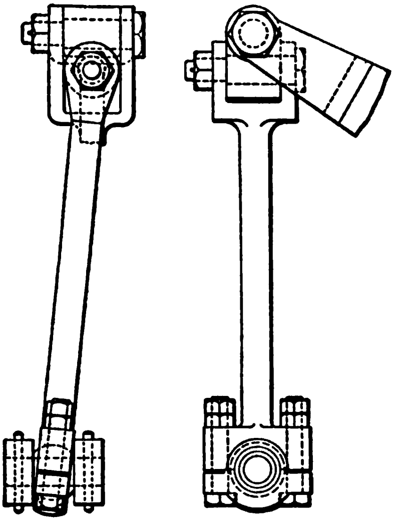


Fig. 13. Radius Bar Lifter

The valve gear is operated by a hydro-pneumatic reversing mechanism, Figs. 14

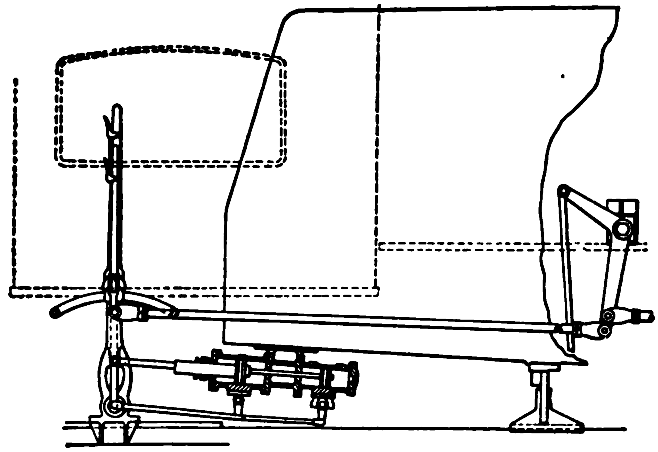


Fig. 14. Reverse Lever Arrangement

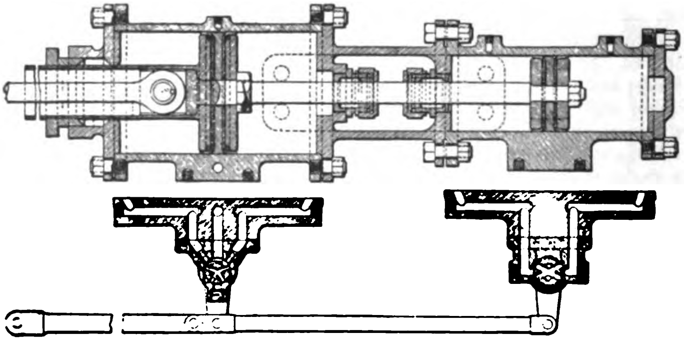


Fig. 15. Reversing Cylinders and Valves

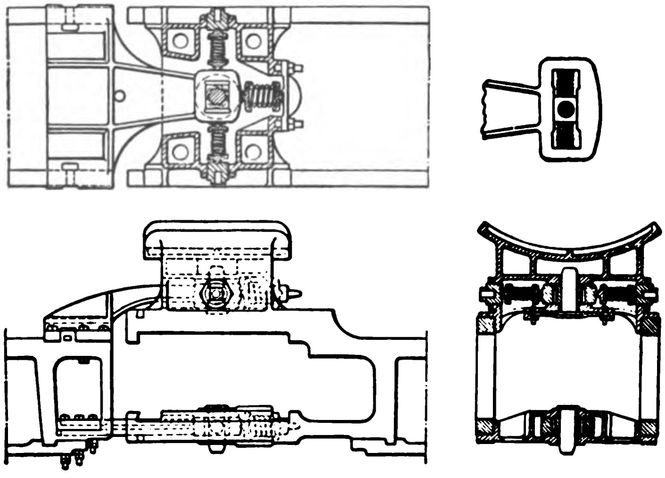


Fig. 16. Baldwin Frame Pivot Connection

and 15, consisting of one air and one oil cylinder, with the common piston rod connected to the main reversing lever. On a suitable location on the main lever is pivoted a second lever for operating the gear.

A forward movement of this lever throws its lower end backward, turning the valves of the air and oil cylinder (shown in Fig. 15), thus making communication with the rear end of the air cylinder for air pressure to force the piston forward and, with it, the entire gear. The oil cylinder serving as a lock and regulator has, by this movement, established communication between both sides of its piston, allowing the latter to follow the movement of the gear, to which it gives a moderate and uniform motion because of the contracted passage for the oil through the valve. By stopping the movement of the operating lever, the gear moves the main lever up to the given relation to the former; and then, automatically, shuts off the air supply and locks the oil cylinders.

In unlatching the operating lever, the same movement raises the main latch, which cannot drop until again in the given relation to the former, when the valves of both air and oil cylinders are closed and a positive locking of the gear is secured in addition to that of the oil lock. The handle part of the main lever is made for the purpose of operating the engine by hand in the absence of air pressure or any disorder of the gear.

These illustrations show only a few parts peculiar to this special type of locomotive as ordinarily constructed by the American Locomotive Company. These locomotives have proved very satisfactory in every respect, and have practically become a standard with these builders, but are of course subject to variations as may suit various service conditions.

The most striking variation in any of these details is probably the intermittent draft coupling of this type of locomotive turned out by the Baldwin Locomotive Works, shown in Fig. 16, where a lateral play is provided for, and the draft pin is held in a central position by a series of springs. With the exception of some articulated engines built by them for service in Porto Rico in 1904, the first of this type built by the Baldwin Locomotive Works were those constructed for the Great Northern Railway; the pivot connection of which is shown in the previous figure. Of this design 67 engines are now in the service of the Great Northern, 3 on the Chicago, Burlington and Quincy and 16 on the Northern Pacific. The general design is shown in Fig. 17. These engines are giving universal satisfaction, and the present number is the result of repeat orders without any change whatever in design.

The above mentioned builders have also excluded the use of by-pass valves, double ported slide valves, and the intercepting valve in their cylinder construction, the starting being effected by simply letting live steam into the receiver.

The question of superheating the steam in connection with this type of locomotive has been considered practically from the outset. Superheating would further increase the efficiency of the engine, but it has so far been deemed advisable to leave it off to avoid complications until this type becomes more generally known.

Fig. 18 illustrates a design of Mallet locomotive prepared in accordance with instructions from Mr. Kendrick, vice-president of the Atchison, Topeka and Santa Fe Railroad, now being built under his patents by the Baldwin Locomotive Works. In this design the combustion chamber, which is also fitted with superheater device, is used.

Among the various differences between this class of engines and that of the ordinary type is the action of this engine when loaded to the slipping point. While the former is less liable to slip than the latter, due to a more uniform pressure on the pistons, they will not be considered loaded to anywhere near their capacity until slipping takes place, and consequently slipping does occur on heavy grades. With the ordinary engine, slipping at such times is a serious matter, as the train is losing speed and may stall on that account after a few repetitions. In the case of the articulated engines, the loss in power by the slipping of one engine is practically gained by the other, in the increase of unbalanced pressure that thereby results. This difference in the unbalanced pressure has the opposite effect on the slipping engine, usually causing it to stop slipping after a few revolutions, without the necessity of closing the throttle. This is explained by the fact that, when the low-pressure engine slips, the receiver pressure naturally falls and reduces the back pressure on the high-pressure piston, as well as the forward pressure on the low-pressure piston; causing the latter engine to stop slipping

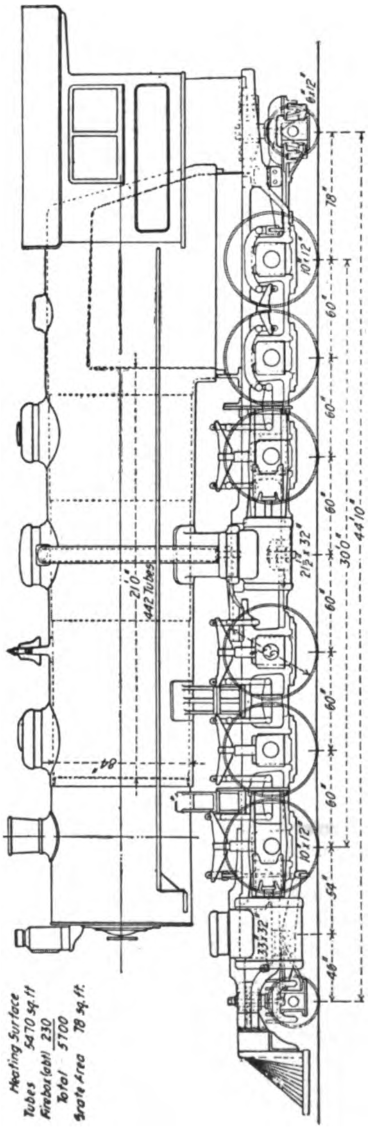


Fig. 17. Elevation of Articulated Locomotive for Great Northern Railway, built by Baldwin Locomotive Works

on account of the friction against the rail under the reduced receiver pressure, which reduction also increases the average unbalanced pressure on the high-pressure piston a corresponding amount.

When the high-pressure engine begins to slip, the receiver pressure increases by the more rapid supply of steam, and with this the back pressure on the high-pressure piston is increased, causing this latter engine to resume its grip on the rail and increasing the power of the low-pressure engine until the normal power is restored in the high-pressure engine.

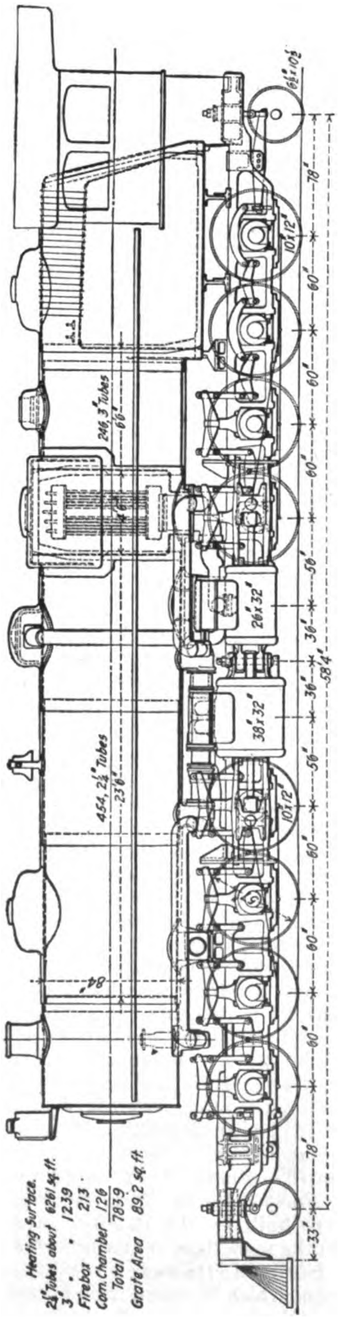


Fig. 18. Elevation of Articulated Locomotive building for the Santa Fe, at the Baldwin Locomotive Works

It is further to be noticed that a simultaneous slipping of both engines is a very rare occurrence; due to the fact that there is one position of the crank where the turning effort is greater than in other positions, and this is where the slipping generally starts at irregular intervals of revolutions, depending on the condition of the engine as necessity for repairs. If the wheels are of a very close approximation to the same diameter and running on

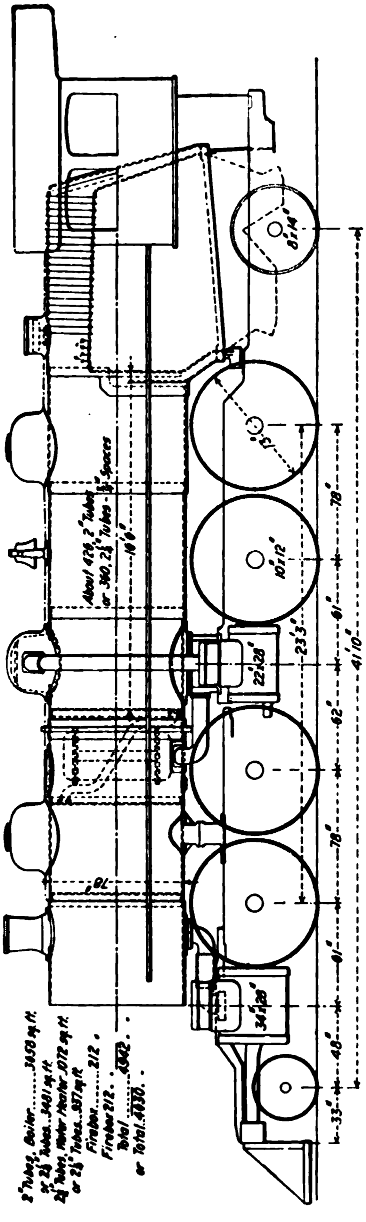

8" Tubes, Boiler......3658 sq.ft.
or 2¼" Tubes...3481 sq.ft.
2¼" Tubes, water heater 1072 sq.ft.
or 2¼" Tubes...937 sq.ft.
Firebox......212
Firebox 212
Total......4942
or Total 4630
About 476, 2" tubes or 360, 2¼" tubes
18'0"
22½x28"
34½x28"
33"
48"
61"
78"
62"
61"
78"
23'3"
41'10"

Fig. 19. Proposed Design of Articulated Passenger Locomotive for the Santa Fe, by Baldwin Locomotive Works

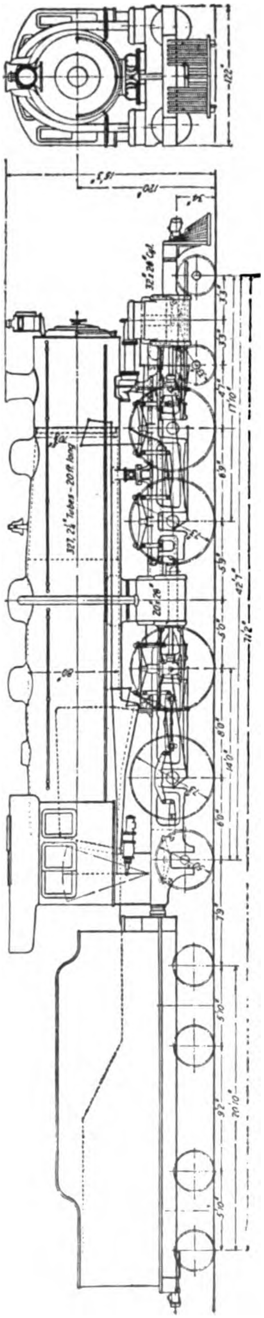


Fig. 20. American Locomotive Company's Study of Articulated Passenger Locomotive

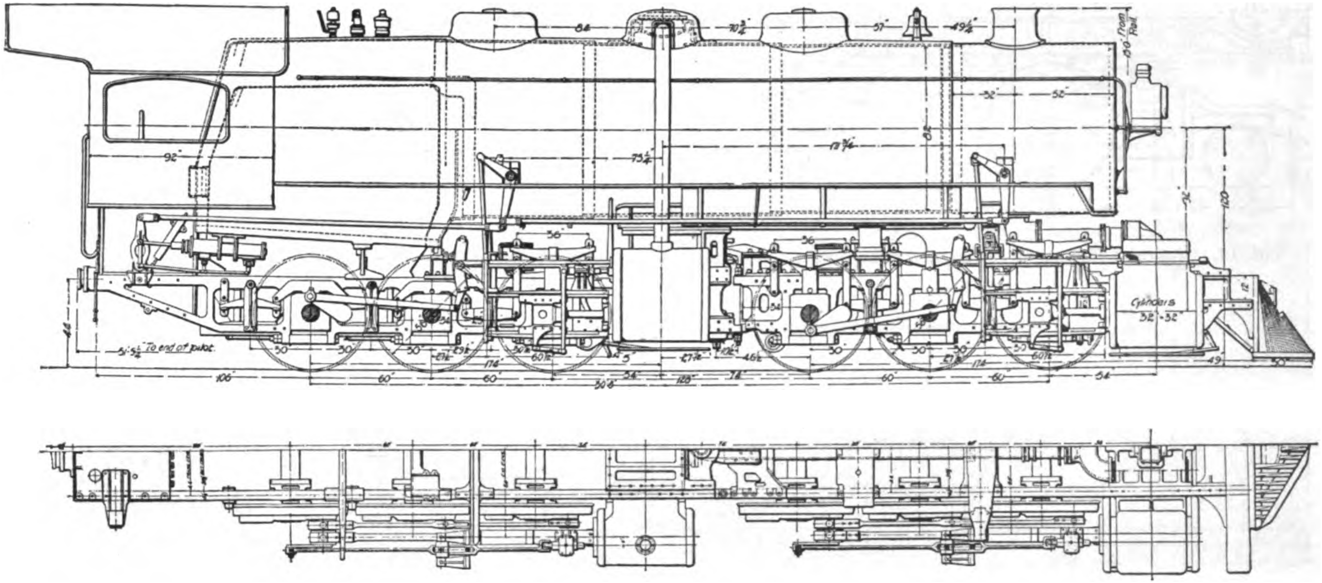


Fig. 21. Elevation and Half Plan of Articulated Locomotive for the Baltimore & Ohio, built by American Locomotive Company

a straight track, these intervals are longer, because the opposition between the wheels requiring readjustment is less frequent than when the wheels are unevenly worn. In either case, there is the greatest liability for this adjustment in the neighborhood of the greatest turning movement; say every fourth or fifth revolution, on a normal rail condition. Being two independent engines, the coincidence of these conditions is very infrequent. The slipping of one engine may follow that of the other due to the temporary increase in power; but one is seldom found to start slipping before the other has stopped slipping; and it can, therefore, be said without much exaggeration, that this type of engine is, in effect, a nonslipping engine.

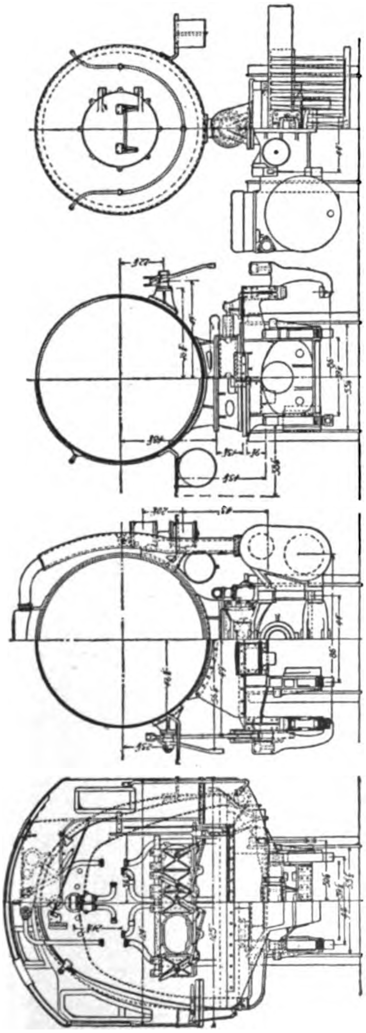


Fig. 22. Cross-Sections of Articulated Locomotive for the Baltimore & Ohio, built by American Locomotive Company

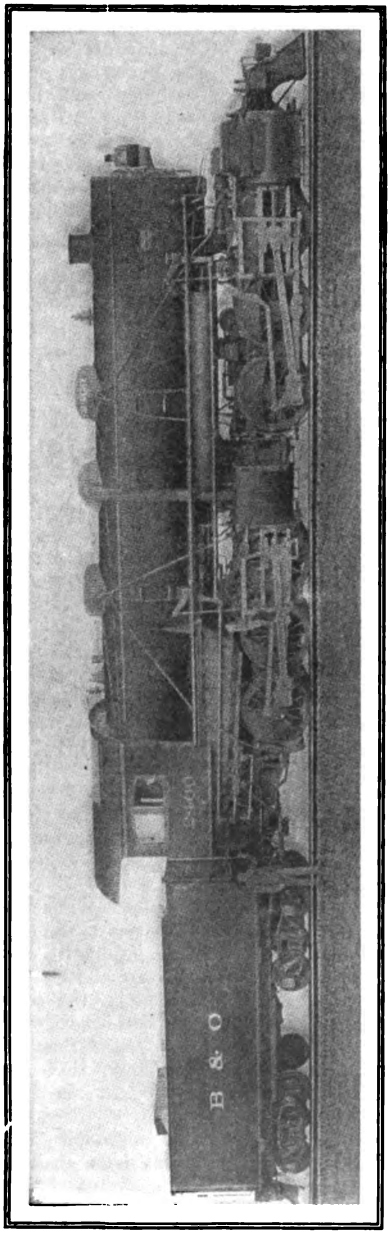


Fig. 23. The First Mallet Articulated Compound Locomotive built in America, built for the Baltimore & Ohio Railroad by American Locomotive Company

When working live steam in all cylin-

ders, generally known as working simple, the slipping is even less perceptible, although over 20 per cent. more power is developed, because the live steam supply to the low-pressure cylinders and the direct exhaust from the high-pressure cylinders are restricted to a very moderate piston speed. From the beginning of the slip, the low-pressure piston gets a rapid motion which causes a sudden fall in the pressure, and the slip generally stops after a few inches movement of the piston under normal weather and rail conditions. The restricted supply port being fully open, however, the pressure is restored practically simultaneously with the stopping of the slipping.

The high-pressure engines are not so sensitive, but after a couple of exhausts under slipping, the wheels regain their grip on the rail with comparatively small loss of power and in a period of short duration.

The effect on cars and draft gears in starting heavy trains by this type of engine, as well as convertible compound engines on the same principle, is a most important feature, as it is accomplished with a so-called dead pull, without the necessity of taking advantage of the slack in the train with its destructive jerks. These locomotives are, therefore, easier on the draft gears than simple engines of half their size loaded to their full capacity. The reason for this is found in the great starting and emergency power, previously referred to, with which these engines are provided, so that the slack is taken up under very slow speed. This is generally done with light throttles. The front cars start successively under a slight acceleration of the engine, gradually going over to a retardation before the last cars get into motion, after which the engine is given full throttle. In other words, the train is stretched first and then it is started under direct pull so that there need not be any but slight shocks or jerks.

These engines are adaptable to a greater variety of conditions than the older types, rendering it possible to double the engine power on a given rail weight; and their advantages are most pronounced as displayed on heavy grades and sharp curvatures.

Over a hundred locomotives of this type have been built up to the present date in this country, ranging in weight on drivers from 106,000 pounds to 410,000 pounds, and from 20,000 pounds to

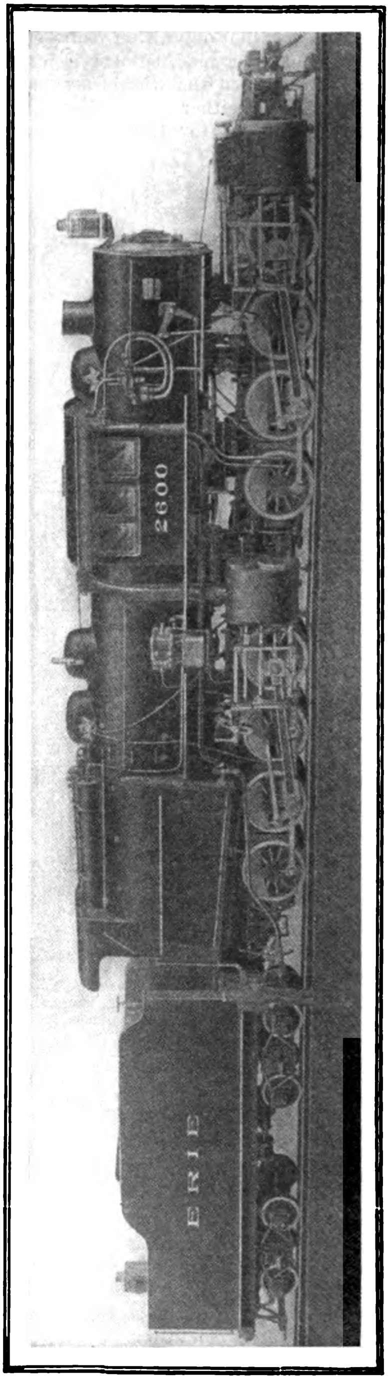


Fig. 24. Heaviest and Most Powerful Locomotive in the World—Mallet Articulated Compound Locomotive, built for the Erie Railroad by American Locomotive Company

125,000 pounds in tractive power. The largest of these is taking the place of three ordinary sized locomotives in pushing service, and is doing its work very satisfactorily.

Their success in freight service will undoubtedly lead to their adoption in passenger service; especially in certain localities to avoid double heading, as the Pacific type locomotive is practically the upper limit for one set of drivers. It, therefore, appears that further development will have to be in the flexible driving wheel base or articulated type.

Fig. 19 shows a design of Mallet type locomotive for passenger service, fitted with reheater between the high and low-pressure cylinders and feed water heater in combination therewith, prepared by the Baldwin Locomotive Works for the Atchison, Topeka and Santa Fe road. Engines of this design are now under construction at the Baldwin works.

An American Locomotive Company's study of an articulated passenger locomotive is shown in Fig. 20, which is a preliminary diagram of a 4-4-4-2 class. Neither the front truck nor the trailer has any side motion beyond their ordinary axle play because the individual wheel bases would be too short to guide this engine safely without the rigidity of the truck and trailer. The truck, however, has a rigid center pin around which it can adjust itself in a curve without restriction by the alignment of the engine.

It should also be remarked that, due to absence of jerks and slack in starting, as well as the more uniform cylinder pressure, the stresses on the machinery and framework are considerably reduced; and, further, that the milder exhaust produces a less intense heat and a better utilization of it, all of which contribute to a reduction in the repairs of the locomotive as a whole, compared with a simple engine if it were practical to construct one of this type. This has never been advanced as a feature to the credit of the articulated engine because it is difficult to give it any definite value; but is referred to as a reply to the often repeated supposition that these engines are hard to keep in repair. As a matter of fact the opposite is the case, because on account of the subdivision of the work in two engines the parts are lighter and easier to handle in repairs and renewals.

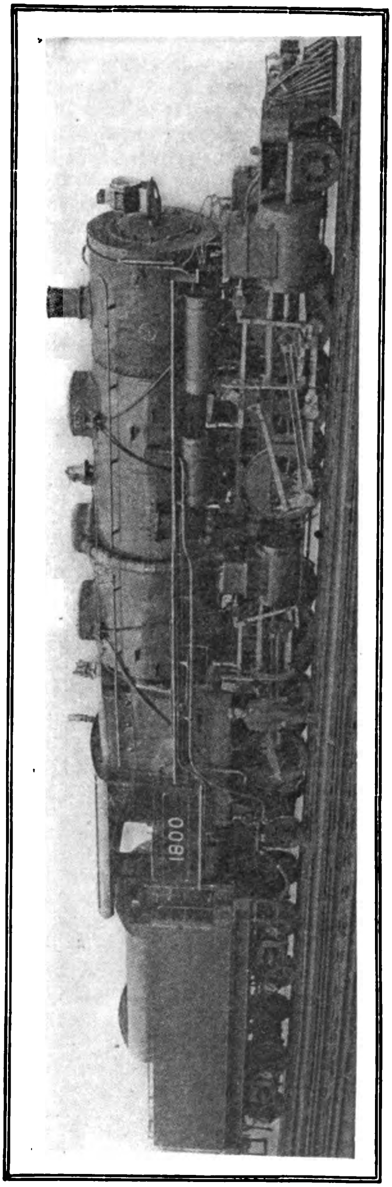


Fig. 25. Mallet Articulated Compound Locomotive, built for the Great Northern Railway by the Baldwin Locomotive Works

One of the fundamental principles in locomotive engineering, as applied to conditions as they exist in the United States, is simplicity of construction. This has led to a general reluctance on the part of American railway officials to accept complications as long as they could avoid it. The tendency toward heavier trains has, however, made it necessary to supply units of larger hauling capacity than have heretofore been necessary any-

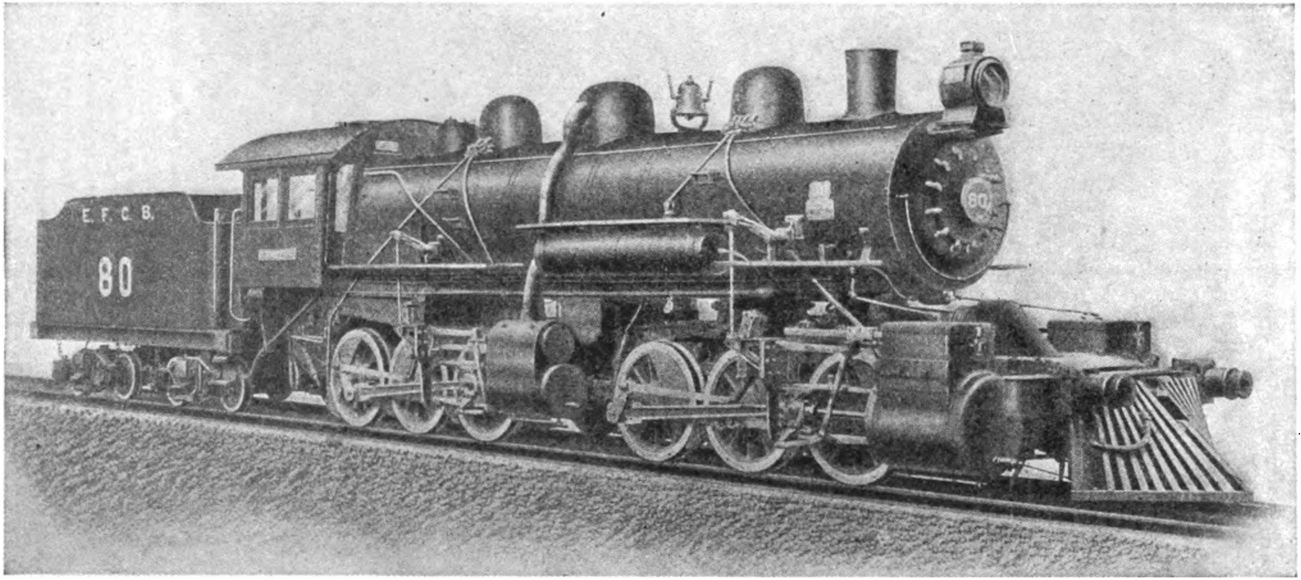


Fig. 26. Mallet Articulated Compound Locomotive, built for the Central Railway of Brazil by American Locomotive Company

where in the world. For the most exacting freight service locomotives are required which have entirely outgrown the possibilities of ordinary construction; in very much the same way as marine requirements have outgrown the types of propelling engines which were entirely satisfactory a generation ago. In fact, the demand for units of large power compels special construction; in order that the large units may be operated without damage to the track and structures, and to avoid increasing the size of the moving parts of the locomotive to a prohibitive point.

The articulated locomotive represents the highest development in this branch of engineering; and the development is sufficiently important to justify the presentation of the subject in its present stage before a body of engineers who have had much to do with corresponding developments in stationary or marine practice.

For the data and illustrations contained in this paper the writer wishes to express his indebtedness to the American Locomotive Company and to Samuel Vauclain, general manager of the Baldwin Locomotive Works.

◆ ◆ ◆

Track Construction.

The question of heavier and better rails has received a great deal of attention during the past few months. Still, experience with the heavier rail, 100 pounds per yard, has not been entirely satisfactory, and it is said that rails weighing 80 and 85 pounds per yard are rendering efficient service under the heaviest rolling stock.

Locomotives and cars are now being built of such height that their center of gravity has been raised considerably over what was customary a few years ago, and the mass of parts overhanging the wheels of locomotives has been increased to such an extent that the excess weight thrown to one side or the other of the track by reason of elevation on curves, track out of alignment, etc., is out of proportion to the ratio of increase in dead weight of the load as a whole.

To overcome this instability or top-heaviness occasioned by the increased height and weight of locomotives and cars, the question has been raised if it would not be advisable to increase the length of ties over the now almost universal standard of 8 feet. It is said that some roads have recently made 8½ feet the standard, while many careful students of track maintenance believe that a length of 9 feet would more nearly meet the requirements, as the longer tie would give increased bearing surface, reduce the pressure on the ballast and add greatly to the side stability of the track, presenting, as it were, a wider pedestal on which to stand.

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Comparative Tests of Run of Mine and Briquetted Coal on Locomotives.

A bulletin on the comparative tests of run-of-mine and briquetted coal on locomotives and on a torpedo boat has recently been issued by the technologic branch of the U. S. Geological Survey. The author of the bulletin, W. F. M. Goss, consulting engineer of briquet tests, gives the results of the tests in the following words:

1. The briquets made on the government's machines have well withstood exposure to the weather and have suffered but little deterioration from handling.
2. In all classes of service involved by the experiments, the use of briquets in the place of natural coal appears to have increased the evaporative efficiency of the boilers tested.
3. The smoke produced has in no test been more dense with the briquets than with coal; on the contrary, in most tests the smoke density is said to have been less when briquets were used.
4. The use of briquets increases the facility with which an even fire over the whole area of the grate may be maintained.
5. In locomotive service the substitution of briquets for coal has resulted in a marked increase in efficiency, in an increase of boiler capacity, and in a decrease in the production of smoke. It has been especially noted that careful firing of briquets at terminals is effective in diminishing the amount of smoke produced.
6. In torpedo-boat service the substitution of briquets for coal improves the evaporative efficiency of the boiler. It does not appear to have affected favorably or otherwise the amount of smoke produced. The briquets used in this series of tests were of a form requiring

considerable bunker capacity for their storage, but as the form of the briquet is a detail entirely within control, this objection need not apply to the use of the briquets in actual service.

The tests of the coal and briquets on the locomotives were made under the direction of A. W. Gibbs, General Superintendent of Motive Power of the Pennsylvania Lines, by E. D. Nelson, Engineer of Tests, at Altoona, Pa., in co-operation with the technologic branch of the U. S. Geological Survey, which sampled the coal and manufactured the briquets.

Many low-volatile coals, such as those mined in the vicinity of Johnstown, Cambria County, Pa., are semismokeless and therefore very desirable for use in locomotives at or near terminals; nevertheless, on account of their low evaporative efficiency, they have not been found altogether satisfactory when used as locomotive fuel. Their tendency to disintegrate rapidly on the grade during combustion causes large quantities of cinders and sparks of high calorific value to be discharged. These cinders accumulate in the smoke box of the locomotive, obstruct the draft on the fires, and reduce the capacity of the boiler. The investigation here reported, therefore, was undertaken to determine in what measure, if any, the process of briquetting will serve as a remedy for these defects and to discover the effect of the process on efficiency and capacity.

The coal selected for the tests was taken from a mine working the Lower Kittanning coal bed near Lloydell, Cambria County, Pa., on the South Fork branch of the Pennsylvania Railroad. Its characteristics as a locomotive fuel were therefore well known. The Lloydell coal is a very friable, low-volatile bituminous coal, and the carloads selected for the tests consisted of run of mine.

They were loaded and shipped under the direction of J. S. Burrows, of the Geological Survey. The coal was exposed to the weather for thirty days on the way to the St. Louis testing plant, before being briquetted. It showed but little change due to this exposure except a decided increase in moisture, which, however, was eliminated in the briquetting process.

The binding material in all the briquets was water-gas pitch. This material was furnished at the briquetting plant of the United States Geological Survey, in St. Louis, at $9 per ton, or 45 cents per pound. The least amount of binding material that would make perfect briquets was found to be 5 per cent. of the weight of the coal. The cost of the binder in one ton of the 5 per cent. briquets was therefore 45 cents.

The cost of briquetting, including all charges, is estimated to be about $1 per ton of briquets; that is, the briquetting added aproximately $1 per ton to the cost of the coal. The briquets were made, however, in an experimental plant, and the price is for this reason probably not so low as if they had been made on a much larger scale.

The briquets were made by the fuel-testing plant of the United States Geological Survey at St. Louis. The coal was shipped from the mine at Lloydell under the supervision of an inspector of the Survey, who at the same time obtained mine samples. The samples were hermetically sealed and sent to the St. Louis laboratories for analysis. After the coal was made up into briquets it was returned to the locomotive testing plant at Altoona, Pa., for the tests.

To observe the effect on briquets of exposure to the weather, a number of the round and square briquets were placed on the roof of the testing plant. After four months of exposure for the round and three months for the square briquets, no change whatever from their original condition was noticed. They appeared to be entirely impervious to moisture and were still firm and hard.

The briquets were little affected by handling. They were loaded at St. Louis in open gondola cars and shipped to Altoona, where they were unloaded by hand and stacked. They were handled a third time in taking them to the firing platform of the test locomotive. After these three handlings they were still in good condition, very few were broken, and the amount of dust and small particles were practically negligible.

The results of the tests justify the following conclusions:

(a) The evaporation per pound of fuel is greater for the briquetted Lloydell coal than for the same coal in its natural state. This advantage is maintained at all rates of evaporation.

(b) The capacity of the boiler is considerably increased by the use of briquetted coal.

(c) Briquetting appears to have little effect in reducing the quantity of cinders and sparks; the calorific value of these, however, is not so high in the briquetted as in the natural fuel.

(d) The density of the smoke with the briquetted coal is much less than with the natural coal.

(e) The percentage of binder in the briquet has little influence on smoke density.

(f) The percentage of binder for the range tested appears to have little or no influence on the evaporative efficiency.

(g) The expense of briquetting under the conditions of the experiments adds about $1 per ton to the price of the fuel, an amount which does not seem to be warranted by the resulting increase in evaporative efficiency.

(h) With careful firing, the briquets can be used at terminals with a considerable decrease in smoke.

(i) The briquets appear to withstand well exposure to the weather, and suffer little deterioration from handling.

In co-operation with the Missouri Pacific, the Lake Shore and Michigan Southern, the Michigan Central, the Chicago, Rock Island and Pacific, the Chicago, Burlington and Quincy, and the Chicago and Eastern Illinois railroads, 100 locomotive tests have been made by the United States Geological Survey to determine the value, as a locomotive fuel, of briquets made from a large number of western coals. All tests were made on locomotives in actual service on the road. In some tests there was small opportunity for procuring elaborate data, but in others, where dynamometer cars were employed, it was possible to obtain more detailed results. The purpose which these tests were intended to serve was not so much to determine the evaporative efficiency of briquets as to investigate their behavior in practical use.

Briquets made from Arkansas semi-anthracite, two qualities of Indian Territory slack, Indian Territory screenings, Missouri slack, Indiana Brazil block slack, coke breeze, and a mixture of coke breeze and washed Illinois coal were tested, and comparisons were drawn either with the same coal that was used in the briquet or with coal similar to it. In nearly every test the results reported show that the coal when burned in the form of briquets gives a higher evaporative efficiency than when burned in the natural state. For example, Indian Territory screenings give a boiler efficiency of 59 per cent., whereas briquets made from the same coal give an efficiency of 65 to 67 per cent. Decrease in smoke density, the elimination of objectionable clinkers, and an apparent decrease in the quantity of cinders and sparks are named as the chief reasons for this increased efficiency.

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Prevention of Accidents Due to Disobedience of Rules.

That the merging of the Railway Age and the Railroad Gazette into the Railroad Age Gazette, has in no way modified the sentiments of antipathy entertained by the editorial management of that publication for labor organizations—and railroad brotherhoods in particular—must be manifest to any of its fair-minded readers. It apparently takes special delight in publishing anything disparaging to these organizations, and an article or communication of that nature is eagerly welcomed by it and dished out in its columns as a rich morsel. It will even go so far in its editorial comments as to distort its contributors' inoffensive references to our brotherhoods into hostile criticisms. In its issue of January 22d that periodical published a communication under the above heading and over the *nom de plume* of "Vidi," as follows:

ST. LOUIS, December 4, 1908.

To the Editor of the Railroad Age Gazette:

In the Railroad Age Gazette of November 20, page 1,407, I note an article in regard to a convention held in Indiana under the auspices of the State Railroad Commission to discuss the best means to prevent accidents. Representatives from the commission and railroad officials, as well as train and enginemen, were present. Certain speakers intimated that investigations as to causes of accidents were sometimes avoided because officials were timid about clashing with labor organizations.

I cannot but believe (if it is a fact that such conditions exist) that it is largely due either to lack of experience upon the part of the person conducting the investigation or to the fact that the investigation was not thorough enough. If, after an accident occurs, the investigation is conducted in a thorough manner and the persons at fault are properly disciplined, no one need fear any railroad labor organization. I say this after much experience with salaried committeemen representing the various organizations on a large railroad.

If care had been exercised in the past to properly administer discipline to those who violated rules, and the necessary time had been taken by superintendents to carry their investigations far enough to make it clear to those at fault wherein they erred, labor organizations would not be as prominent today as they are.

In the Railway Age about two years ago I gave briefly my views with respect to methods that would aid in preventing a large percentage of the accidents occurring from causes chargeable to the transportation department. From careful study of the subject since then, I am still of the opinion that on many roads not enough care is taken to require the rules to be obeyed when accidents do not occur. It seems to be the rule, rather, to wait until an accident occurs and then take action with those at fault, without ascertaining to what extent the rules violated (which caused the accident) had been disobeyed by other employes without any question ever being raised.

To my mind nothing will do more to prevent accidents due to causes controlled by the transportation department than to require the rules to be obeyed, and to take the necessary action to bring about this result, without waiting for accidents to occur. To do this, however, it will be necessary to have closer supervision than most roads provide. The trainmaster's territory should be short enough to enable him to cover it easily each day. The superintendent's territory should be short enough to enable him to know all the train and enginemen personally, and to be so well acquainted with each one that he will know his habits and disposition.

I am aware that on some roads the men are given demerit marks before accidents occur, but is the supervision close enough so that this is judiciously done? Is it close enough to insure all being dealt with equitably? And is it close enough to get records of the good acts, as well as the bad ones? Unless it is, there is a weakness that will never be overcome by waiting until an accident occurs, even if severe action is then taken with those at fault.

Bad and indifferent men cannot stand close supervision. They can be easily weeded out, regardless of any labor organization. On the other hand, men who are naturally good, but who may have drifted into slack habits through lack of proper education or the right kind of supervision, will be gradually led back to proper ways and they will retain their positions. Many a man who would have been a good conductor, brakeman or engineman, with proper training, has been dismissed after an accident occurs, when with the right kind of education he would have prevented the accident and saved his position. He had gradually drifted into careless ways because of improper supervision.

Not only should the territory of a superintendent or a trainmaster be short enough to permit of their frequently visiting all parts; they should be able to spend a reasonable time at division terminals and other places where employes congregate, and to give more attention to that feature of their work than is usually done. Too often, particularly during busy seasons, the work of employing men is delegated to yardmen and even clerks, and thus undesirable men creep into the service. It is true that these undesirables can be got rid of, but much good can be accomplished by exercising additional care in employing men.

There is another point in connection with accidents that I have not seen much discussed; accidents that have been caused by some infraction of the rules upon the part of the trainmen or enginemen, but which would have been prevented by proper care upon the part of the train dispatcher. The standard rules are rather silent on safe practices pertaining to train dispatching, but the old time dispatchers maintained many precautions under what we might call unwritten rules, which were of much value. But as the requirements of the office became more burdensome the younger men gradually dropped these safeguards until now they are often lost sight of. The chief train dispatcher should frequently check the order book and also the train orders turned in by train and enginemen at the end of their trip. This should be arranged for by lessening their other work and giving them more time to properly attend to the duties of a chief dispatcher. Where the territory of superintendents and trainmasters has been long, it has caused both of these officials to unload a large amount of work on the chief dispatcher. This is unfair. VIDI.

The Railroad Age Gazette comments editorially on the above article as follows:

Bad and indifferent men cannot stand close supervision. They can be easily weeded out, *regardless of any labor organization*. This declaration is made by the general superintendent of a prominent road, and he is a man of wide experience. He is too modest to publish his name, but his letter, signed "Vidi," and printed on another page, is well worth reading. And by "close supervision" he means keeping such constant and intelligent watch of the men's work that their merits and their demerits shall always be recorded with strict and judicious equity. The superintendent who gets a good quality of service out of his men without this kind of supervision has to thank the self-training and the good motives of his men, not his own efficiency as a superintendent. "Vidi" points out as one of the main weaknesses of railway management a fault which has often been denounced in these columns—assigning to superintendents and trainmasters too much territory or too many men. When this is the case important duties are delegated to inexperienced assistants. As to *why* labor unions are able sometimes to overawe the superintendent, our correspondent uses plain language; either the superintendent is inexperienced—is not fit for his job—or he lacks the courage to go to the bottom of the matter, get all the facts, and, in blaming an employe, take the time necessary to induce him to admit the reasonableness of the censure. Will any superintendent say that this is not a correct judgment? Finally, one of the best things in the letter of "Vidi" is his assertion that careless employes may be restored to the careful class. And he seems to imply that most "accidents" are chargeable to these men whose dulness or carelessness is due neither to a reckless disposition nor to the influence of a malicious brotherhood leader, but to "slack habits," which are curable.

Note the emphasis placed on the following sentence: "They can be easily weeded out, *regardless of any labor organization.*" And again wherein the statement is made: "As to *why* labor unions are able sometimes to overawe the superintendent, our correspondent uses plain language," etc. The meaning intended to be conveyed in the above editorial expressions, and which Railroad Age Gazette charges as coming from the writer of the afore-mentioned article—if we are any judge of a man's characteristics as reflected from his expressions on paper—is diametrically opposite to that intended by the said writer.

"Vidi" says: "If, after an accident occurs, the investigation is conducted in a *thorough manner* and the persons at fault are properly disciplined, *no one need fear any railroad labor organization.*"

This is a straightforward, manly statement, and means but one thing, and that is: Railroad labor organizations desire and ask for just such thorough investigations and *proper* discipline as he indicates, and if the official conducting such investigation is thorough and impartial in his work and *properly* disciplines the employes at fault, such official will have the good will and co-operation of the railroad labor organizations. "Vidi" agrees with this when he says: "I say this after much experience with salaried committeemen representing the various organizations on a large railroad."

Such a statement coming from the "general superintendent of a prominent road," and "a man of wide experience," as Railroad Age Gazette says, is a splendid endorsement of the conservative and fair-minded policy pursued by the railroad brotherhoods toward their employers, and of the ability and broad-mindedness of the salaried chairmen of our joint protective boards with whom the officials come in frequent contact.

We do not know who the general superintendent referred to is, but it is our opinion that he is one of those broad-gauge, fair-minded officials who is as ready to approve a meritorious act and commend an employe for the exercise of good judgment as he is to censure and discipline for an infraction of the rules. Such a man is admired and held in the highest esteem by his employes, and if we are wrong in our portrayal of the afore-mentioned general superintendent, all we can say is that we have been greatly deceived.

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The Strouse Automatic Stoker—Past Grand Master Hannahan Vice-President of the Company.

On January 1st last Past Grand Master Hannahan took up the duties of vice-president of the American Automatic Stoker Company, manufacturers of the Strouse automatic stoker. For some years the work of perfecting a mechanical stoker to successfully fire locomotives automatically and produce all the desired results has been engaging the attention and best efforts of some of the brightest mechanical minds of the country. In the Strouse automatic stoker it is claimed that a mechanism has been developed which will meet all requirements, and it is believed by those who are directly interested in its success that it but requires the work of such a man as Past Grand Master Hannahan to bring the machine into general use. In this it is needless to say there is no danger of their being disappointed.

It is hoped and confidently expected that the mechanical stoker will displace the laborious feature of the fireman's work. With such a machine operating under his command it will, however, be necessary for him to exercise a close observance of the principles of combustion, as the more skilful their application in the manipulation of the machine the better will be the results. It is hardly to be expected that the stoker will prove as great a toil eliminator for the fireman as has the oil burning locomotive, yet it is safe to say that it will reduce his labor very materially. Herewith we give a description of the Strouse automatic stoker, and to Vice-President Hannahan in his new field of activity the Magazine extends its best wishes for unqualified success.

The following description of the Strouse automatic stoker, its construction, operation and performance is supplied by the manufacturers:

The Strouse patent locomotive stoker is of the steam driven, horizontal, reciprocating plunger type, and consists of the following principal parts:

1. *The detachable hopper*, which receives the coal and delivers it on to the plunger distributer.
2. *The horizontal reciprocating plunger*, mounted in guides and provided with a *special shaped distributer*, which properly distributes the coal in the firebox.
3. *The horizontal steam cylinder*, with the valves, valve motions, throttle lever and stoker lever, which control the action of the plunger.
4. *The special fire door*, which is hinged at the top, opens inwardly and is operated automatically. This door replaces the regular fire door. In the event of it being necessary to remove the stoker the regular fire door can be replaced without unnecessary delay and firing done by hand.
5. *The main frame*, which contains or supports the operating parts, and is provided with adjustable legs and suspension rods.

From the above it is seen that the Strouse stokers are very simple and composed of very few parts.

Design, Material, Workmanship and Testing.—They are constructed almost entirely of cast and wrought steel, and are consequently very strong and durable. The wearing parts are made extra large, thus reducing the maintenance to a minimum and increasing the reliability to a maximum.

The workmanship is of the best quality throughout, and all the stokers are thoroughly tested under pressure at the works before shipment.

All parts are made interchangeable so that any part can be cheaply and quickly replaced.

In short, these stokers are very simple, strong and reliable.

Operation.—The operation of the Strouse stoker is very easy, as the fireman simply fills the hopper, and then by moving the stoker throttle lever operates the stoker according to demand.

Regulation.—Usually no regulation is required, as the distributer is designed to fire the engine perfectly without any adjustment, but the length and strength of the stroke is easily governed at any time required by simply moving the stroke lever.

Requirements.—The Strouse stokers are designed to fulfill the following requirements:

1. Absolutely reliable, durable, simple, compact and easily operated.
2. Fire successfully all sizes and kinds of coal suitable for proper combustion, including inferior grades of coal.
3. Produces a very substantial saving in coal under ordinary operating conditions.
4. Control admission of air into the firebox.
5. Fire in small quantities at frequent intervals according to demand.
6. Maintain a light, bright, clean and uniform fire, requiring less draft, permitting the use of larger nozzles, reducing the back pressure, preventing clinkers, reducing the smoke, etc.
7. Enable the average fireman to produce results continuously better than expert hand firing.
8. Reduce the labor of the fireman, giving him more time and endurance to properly perform all of his duties, and also preserve the firemen's eyes and health.
9. Require only simple, brief, plain instructions to be efficiently operated.
10. Fire practically perfect throughout the longest and heaviest runs.
11. Reduce cleaning of fire to minimum.
12. Maintain full uniform steam pressure all of the time, permitting engine to be worked to its fullest capacity.
13. Suitable for all types and sizes of locomotive fireboxes with practically no alterations of any kind.
14. Easily and quickly attached or detached.
15. Allow easy inspection of the fire at any time.
16. Require little or no adjustment for all changes in coal or other conditions.
17. Reduce the flue and firebox leaks and repairs.
18. Make no objectionable noise.
19. No parts fixed inside of firebox to warp or burn out.
20. All parts interchangeable, strong and inexpensive to maintain.

21. Automatic draft relief when engine slips.

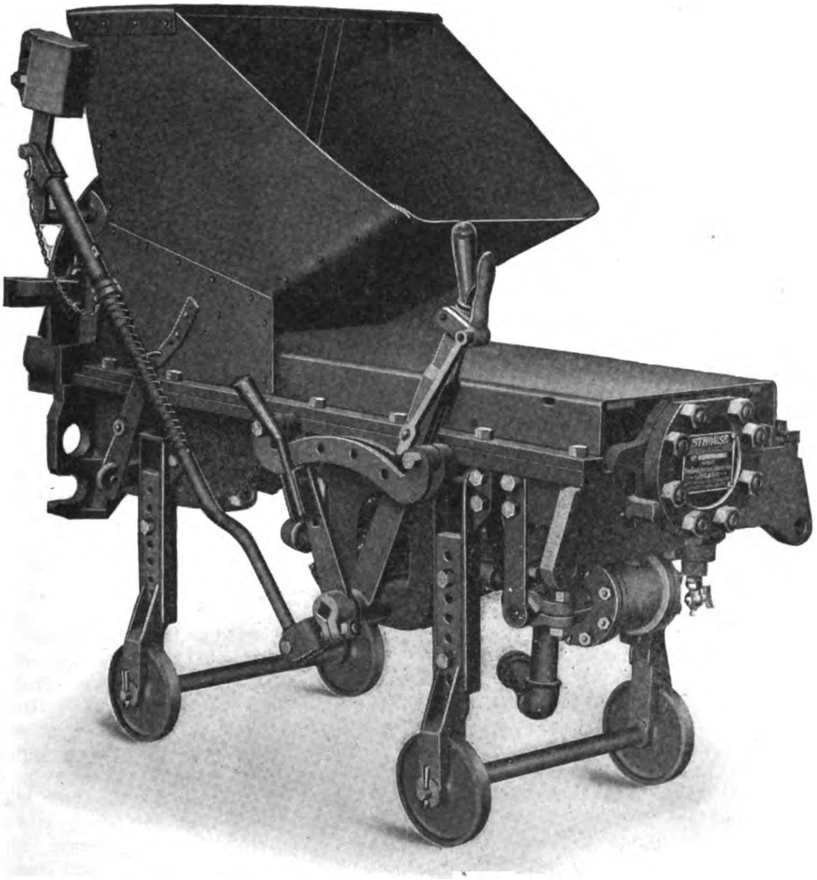
22. Assure a real dividend earning investment for the railroad and a decided improvement in labor conditions.

Performance.—These stokers now fire heavy consolidation engines on the longest and heaviest runs, with full tonnage, with practically no variation in the steam pressure and without any other attention to the fire except the shaking of the grate occasionally, and moreover the fire is usually in perfect condition at the end of each run, even when burning inferior grades of coal.

The saving in coal in regular daily service has averaged from 10 per cent. to 20 per cent. over the best hand firing performances under the same conditions.

The boiler leaks and repairs have been greatly reduced and the runs are made without cleaning the fire.

The enginemen who have used the Strouse stokers like them very much and will verify all of the above.



The Strouse Automatic Stoker for Locomotives

One of these stokers is clearly shown in the accompanying illustration. They have been in use for a considerable time on the Iowa Central Railway, on which line it has been developed, being the invention of a locomotive engineer of that road.

Below is given the performance sheet of three locomotives of the same class on the Iowa Central Railway during the month of July, 1908, one of the locomotives being fitted with the stoker while the other two were not. The results shown are quite favorable to the stoker.

Performance.	*Without.*	*Without.*	*With.*
Engine Numbers	81	83	85
North Bound—			
Number of trips	10	11	10
Miles run	1,820	2,002	1,820
Average tonnage	927	921	925
South Bound—			
Number of trips	10	10	11
Miles run	1,820	1,820	2,002
Average tonnage	832	799	791
Both Directions—			
Number of trips	20	21	21
Miles run	3,640	3,822	3,822
Average tonnage	879	860	858

Performance.	*Without.*	*Without.*	*With.*
Miles run per ton of coal	12.50	12.97	15.22
Lbs. coal per 1,000 ton miles	181	179	155
Average time per trip, in hours and minutes	9.16	9.23	9.18
Average miles per hour	20	19.35	20

Maximum Grades—

Oskaloosa and Mtown	.7 of 1%
Mtown and Abbott	1¼%
Abbott and Albert Lea	1%

It is reported that the Chicago and Alton Railroad has ordered the Strouse automatic stoker applied to twenty locomotives now being built by the American Locomotive Company, several of which will be delivered at an early date.

The offices of the American Automatic Stoker Company are located at Room 213, Railway Exchange Building, Chicago, Ill.

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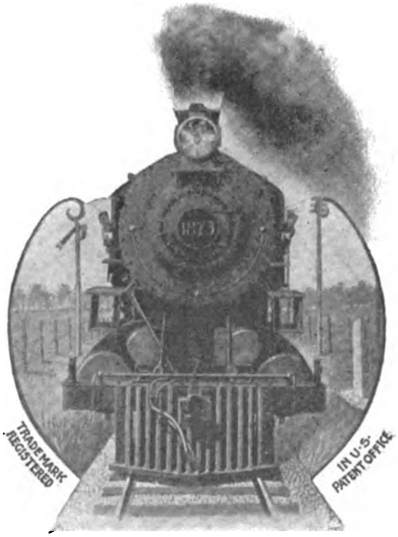

Technical Contributions

WHY THE WHEELS STOPPED TURNING
(BEFORE THE TRAIN STOPPED)

OR

THE MYSTERY OF THE SLID-FLATS

BY WILL W. WOOD

All of the Air Line enginemen that were in off the road and were not asleep or in pursuit of worldly pleasures, were in the Air Car, and as the air-brake instructor arose behind the altar formed by a table-topped main reservoir, and began slowly turning the leaves of the Proceedings of the 1908 Convention of the Air-Brake Association, a comparative quietness settled down upon the assembled Knights of the Rail (Fin McCool says that if any of 'em ain't never been rode on a rail they've missed their dividends), until you could hear even the flue rattler over in the boiler shop; but when the air-brake boss started talking we honored him with a muchness of quiet and he gave us a mighty interesting lecture on stuck brakes and slid-flat wheels, and which I am going to try to repeat for the benefit of those who were not there.

"Fellows," he began, "in the address of the Secretary of the Association at the late convention, he refers to the one haunting thought ever present in the air-brake man's mind, that is voiced into his waking ears in the cold, gray dawn of the morning, as 'What Causes Undesired Quick Action?' But, my friends, that 'ain't no ha'nt' to me; the specter that frolics around my husky couch, or is enshrined upon my desk, propounds and eternally re-propounds the riddle—'what made those wheels slide flat?'

"Really, it's the hardest proposition the air-brake man is up against; in many cases he is asked the question and the only evidence presented for his information is about like this—'2 prs. wheels slid flat 2½ in. & 3 in., on A L box car No. 41144, Xtra 172 North, 12/24/'08, between A and Z. Please explain why those wheels should slide and flatten.' If the railroad companies really know the money they are losing through slid-flat wheels, I can't understand why they should not require a more thorough taking of evidence—the holding of an inquest at once.

"I am seldom able to explain why certain wheels were flattened; but never mind that; I can tell you how to keep the wheels round—so far as the engineer might be implicated—and that's more to the point. To paraphrase a pair o' phrases—'there's many a slip 'twixt the start and the stop,' and 'the rolling wheel gathers no flat spots.'

"In many cases the engineer is to blame. Now, don't be too assured of your immaculate innocence. I made a round trip on freight the other day; we had a long, heavy train, largely coal loads; leaving Conway the conductor watched every car pass him, and got on the caboose satisfied that all brakes were released, gave the high-ball, and away we went; down hill for five miles, and then a pretty stiff up-grade, and just before we struck the hill the engineer got uneasy—he kept looking back, and finally said: 'I knew that train wasn't swinging along as fast as it should; brake stuck.' It was getting dark, and, sure enough fire was flying from the brake-shoes of a car not very far back in the train. Then he began juggling with the automatic brake-valve—pushed it to release position and quickly back to running position; repeated that several times, and when we hit the grade fire began to sparkle in two other places. Now, I wanted to get over that hill as bad as the engineer did, so I told him to shove the automatic brake-valve handle to release position and leave it there; he did so, and presently the fire quit flashing from the brake shoes, the engine began to make better headway and we didn't hang up.

"He was carrying 100 pounds in the

main reservoir (his single-top pump governor being set at that figure), and of course we soon had the same pressure in the brake pipe; he made the stop at Fishers with one 15-pound reduction, and the fireman, observing the high pressure indicated by the black gauge-hand, and noting the unusually strong blast from the equalizing-discharge valve, said: 'Gee—but that'll make 'em skate.' He was deceived by appearances and the noise, not knowing that any reduction of brake-pipe pressure of not more than 20 pounds will give exactly the same brake-cylinder pressure, no matter whether you are carrying 70 pounds or 100 pounds pressure in the brake-pipe. When we got stopped he further reduced the brake-pipe pressure down to 60 pounds, then released tne brakes and they all came off except two or three that were bled off back toward the caboose—and that was the result of the only real bad feature in connection with having to run with the brake valve in release position—the lack of excess pressure.

"Now," he put up the question, "what made the first brake 'stick' after leaving Conway?"

A full mænnerchor of voices responded "defective triple valve."

That made the instructor grin; said he: "There are a few principles and rules for air-brake practice that every engineman should get permanently fixed under his hat—if he has to paste them there; one is that *there is no defect that can exist in a triple valve that can cause its brake to reapply after it has once been released* either by an increase of brake-pipe pressure or by bleeding the auxiliary reservoir. Westinghouse air-brake experts assert that probably 90 per cent. of 'stuck brakes' are the result of failure to release after a normal application. The best conditioned, most sensitively-working triple valves in the train were undoubtedly those three on the cars whose brakes were stuck."

Now, the boys received this intelligence with about the same approval that Congress accepts a message from President Roosevelt. The instructor had to "show them."

"I watched the black gauge-hand, leaving Conway," he said, "and after it had mounted to 70 pounds it slowly fell back 2 pounds, rose again to 72 pounds, and fell back to 68 pounds; those variations in brake-pipe pressure continued to show on the gauge, but within the figures I have given; it was shortly after the first drop from 72 to 68 pounds that the first brake stuck—"

"That's the result of having a conductor's valve in the caboose," one engineer declared; "hind man was fiddlin' with it—"

"No," replied the instructor, "the violina-de-obligato was being played just an arm length from the locomotive engineer; the slide-valve feed-valve was dry from want of lubrication, and gummy, and they all work irregularly like that when neglected. I will repeat what I have said again and again—an engineer is judged, not so much by his own actions in air-braking, as by the action of his brake-pipe pressure feed-valve and equalizing-discharge valve; for your own benefit and reputation, clean, oil and inspect those two accessories of the brake valve yourself."

And he continued: "We lay at Fishers long enough to take the piston and slide valve out of the feed valve, and we found it in just the condition that the pressure results had already proven; we cleaned the removed parts, and the piston and slide valve bushings, and oiled the bearing surfaces with a little *graphite air-brake and triple valve grease* that I always carry with me; cleaned the little regulating valve, and after leaving Fishers there was but slight variation from 70 pounds in the position of the black gauge-hand."

"If one brake reset itself from the 4-pound fall of brake-pipe pressure, why didn't the other brakes set, also?" an engineer inquired.

"Oh, even at a properly executed service application, probably no two brakes begin to apply at exactly the same time; in the triple valves there is the difference in lubrication, the presence or absence of gum and dirt on the slide-valve face and seat, and piston, the roughness or smoothness of the bearing surfaces, fit of the packing ring in the groove of the piston and in the bushing of the triple-valve body; clean, or partially gummed-up, feed groove in the piston bushing, and same as to the leakage grooves in the brake cylinders; condition of the brake piston packing leathers, etc. In the case under discussion, the reduction was effected by brake-pipe leakage only, and the result can be approximated any time—if you wish to experiment—when you are delayed in a siding, by simply charging your train up to 70 pounds, closing both angle cocks between the tender and first car and uncoupling the hose; then observe as to the difference in time between the applications of the brakes on the different cars due to brake-pipe leakage; of course the brakes having the best triple valves will in nearly every case be the ones that apply first."

"But what made the other two brakes stick about the time that you struck the hill, when the engineer had been throwing waves of high pressure from the main reservoir back into the train line, trying to release the first one that stuck?" Only one engineer asked that question; the others all knew.

"That was just it," was the instructor's answer; "throwing a higher pressure into the brake pipe than the feed valve was set at, and—"

"Yah-hah! What's the reason, then, that when you pushed the brake valve into release position *and left it there* the brakes weren't all stuck by the time the brake-pipe pressure got to 100 pounds, eh?"

"You have the wrong impression; increasing the brake-pipe pressure—no matter how high—cannot cause the application of a single brake; on the other hand it insures their continued release *as long as the increased pressure is maintained;* pulling the brake-valve handle back to running position *after the brake pipe has been overcharged* is what causes the brakes to apply; the reasons for this are generally supposed to be well known, but as a fact, the personnel of locomotive enginemen is constantly moving upward from the bottom—and spilling off from the top—and some of the simplest, and most important instructions in air-brake practice must therefore be repeated indefinitely.

"In the running position of the automatic brake-valve," the instructor explained, "the only way in which main reservoir air can flow to the brake pipe is by the route through the feed valve (no matter whether the feed valve is attached to the brake valve directly, as it has been for years, or is located in one of the pipe lines running from the main reservoir to the brake valve as in the ET equipment), and even the feed valve route is closed when the brake-pipe pressure is at—*or above*—the figure at which the feed valve is adjusted—usually 70 pounds—and it can not go above that figure except through the brake valve *in release position.* Now, therefore, isn't it plain that if we place the brake valve in release position until the brake-pipe pressure is—say 75 pounds, and then draw the handle back to running position, all avenues of pressure supply to the brake pipe are closed? The only possible way of supply is through the feed valve, and it has automatically closed itself, not to open again until the brake-pipe pressure has fallen (through leakage) to 70 pounds, when it will automatically reopen the supply *but will not make any increase of the brake-pipe pressure,* and therefore has no power to release any of the brakes that may have crept on; it merely prevents the pressure from falling any lower; if the brake pipe had been permitted to charge to an equalization with the main reservoir, to—say 100 pounds, a permanent return of the brake valve to running position would have resulted in a 30-pound loss of brake-pipe pressure before its fall would have been checked by the reopening of the feed valve.

"Of course, leakage is a necessary factor in connection with a temporarily overcharged brake pipe to have brakes sticking; heavy leakage can give worse results from a light overcharge than very slight leakage can cause from a heavy overcharge; and under the ideal condition of no brake-pipe leakage whatever, there could be no sticking of brakes at all, under any circumstances of pressure, unless a reduction was purposely made.

"Keep your slide valve feed valve working sensitively and you won't have any reason to use the release position to 'kick off' any brakes that have set through your own fault; but, if the trainmen have done a little brake-setting on their own account, or, if in winter the stiffly frozen hose have oscillated the couplings until most of them start leaking at once when the slack of the train is heavily stretched—in such cases if it is up to you to release those brakes, put the automatic brake-valve handle in release position *and leave it there* until the next regular application;—in fact, it is the experience of many of you, no doubt, that with the air hose of a long freight train in a stiffly frozen condition the release position has to be used as the running position continually, in order to get along.

"Over here in the rep. track they are putting in two new pairs of wheels under a car to replace those that were slid flat in that same train, of same date, after the feed valve had been corrected; and again the engineer was to blame—through an association of two causes; first, for the length of train that his engine hauls this engineer doesn't carry enough excess pressure in his main reservoir—30 pounds isn't enough, especially when there is so much heavy grade braking to do; secondly, in descending those hills on the Middle Division he makes too many applications—works his brake valve too rapidly between service and release positions. I dislike to 'butt in' on a man when he is 'on the firing line,' and I have told him his fault in that respect before that trip, and since; but I noticed that he did such rapid-fire work coming down Summit that his excess pressure began to disappear, and finally he got a brake stuck on one car that he couldn't release—he didn't know it at the time, while I wondered that there weren't indications of several stuck brakes. When you reach the 'first bottom' of Summit you've got a one-mile level to get a run for the knoll at Cromers; he hit 'em up along the level with that stuck brake, and there is where the wheel-sliding and flattening was done; getting over the knoll, the hind man went over to the car—sixth from the caboose—and dropped off and bled it, noting that two pairs of wheels were sliding.

"At Aqueduct 20 empty cars were added to the train. As they pulled out from there I inspected every one of the picked-up cars as they passed me, and I am confident that no brakes were stuck, yet we came into Smithville with four pairs of slid-flat wheels under one of those empty cars, and two pairs in like condition under another one of the same bunch. I was asleep in the caboose when this business was done, but it was one of the few cases in which I have been able to have full and exact evidence to enable me to answer the question when it came—'what caused those wheels to slide and flatten?' For when we got in, after hearing the conductor's report I inspected the cars with damaged wheels, and found nothing abnormal about the air nor foundation brakes; the three triple valves were removed that day for expert test, and while they needed cleaning and lubrication, and were not as sensitive in releasing as I should like, still they were in no worse condition, probably, than a majority of the other triple valves in the train, and they should not have stuck.

"You see, you've got to make up your mind to be able to operate triple valves that are not in first-class condition; triples that are not to say defective, but that require a quick and substantial increase of brake-pipe pressure to release them, for the ideally-equipped air-braked train has never yet been made up.

"You have all been ordered to carry 110 pounds main reservoir pressure, in connection with single-top pump governors, on all heavy freight engines; yet this engineer I rode with has steadfastly refused to raise his red-hand pressure above 100 pounds—he claims that is 10 pounds too much. Now, if he could make good with 100 pounds in releasing pressure, it would be so much the better; but an engineer should, and must, stand responsible for his own work, and it was owing to the lack of 'driving head' of his reserve pressure—and probably in not leaving his brake valve in release position long enough—that entailed the financial loss to this company represented by those flattened wheels."

I've got to cut the rest of it short. "Now," the instructor went on, "I am going to take up the cases of slid-flat wheels *in which the engineer is not to blame;* and of course you are only interested in that as a matter of self-protection—the case of an alibi; but in trying to excuse yourselves from being accessory to the cause in cases of wheel sliding, don't report 'brakes on car not adjusted properly;' if the piston travel was too short, say so, but don't question the 'adjustment,' for that is something which probably you know nothing about, and the officials to whom you make the report know that you don't, too."

(To be continued in the April number of the Magazine.)

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ELECTRICAL RAILROADING

BY ELWOOD GRISSINGER

The speed at which any direct-current motor armature will revolve is determined by the relative strength of the main magnetic field and the magnetic field created by the current in the armature itself. This of course assumes that the voltage delivered to the motor and the load upon the motor are constant. These conditions satisfied, then an increase in the strength of the main magnetic field of force will result in a lower speed for the armature. Conversely, if the main magnetic field is weakened, the armature will immediately increase its rate of revolution. This action of the two fields of force with respect to one another is taken advantage of with suitable devices to regulate or change the speed of motors within certain limits.

When the strength of field created by the armature currents is sufficiently increased, it can be made to overcome the main field of force, in which event, under a light enough load, the armature will quickly increase its speed to a point far beyond the factor of safety. The series-wound motor lends itself more readily than any other type to a demonstration of this feature. Its construction is such, however, that it is essentially a variable speed motor. For every change of load it will have a different speed, the voltage delivered to it remaining the same. Similar variations will likewise cause the motor to exert a different torque. This torque, or turning moment, is the greatest in street railway motors at starting, and it is this characteristic of such motors that enables them to get under headway quickly. Such motors operate in this manner because the lower the speed of the armature, under load, the more current it will draw from the circuit, and since the strength of the main field depends entirely upon the amount of current passing through the armature, such main field is proportionately built up so as to give the armature increased turning effort. With a given motor, the greater the relative strengths of main and armature fields of force the greater will be the turning moment of the armature.

Shunt-wound direct-current motors heretofore referred to are widely used in general manufacturing. They differ electrically from the street railway motor in the manner of constructing the main field and creating its magnetism. The magnetic field is practically uniform (except for armature reaction and distortion) under all conditions of load. It has, therefore, a nearly uniform speed within the limits of its capacity. The field coils obtain their current independently from the supply circuit. These coils are therefore designed to receive current at the pressure of the supply circuit, having an electrical resistance sufficient to prevent the passage of a heavy current through them and having the requisite number of turns of wire to create the necessary strength of magnetic field with the current that such coils are designed to carry. The electrical energy used in such coils for inducing a magnetic field is termed a field current. The windings are so designed that they will efficiently radiate the heat which the passage of the exciting currents through them will generate. Well-designed machines should run very cool in the field windings.

All smaller sizes of shunt-wound direct-current motors are self-regulating as to speed and do not have external devices to be used for the purpose of changing the armature speed. As a result, such motors will run at a slightly higher rate of speed at full load than when running light. The reason for this is already pointed out. The main field is practically uniform in strength, and as the armature current increases in strength with the load, the armature reaction and effects of cross-magnetization weaken the main field somewhat, thereby causing the armature to increase in speed. Larger sizes of shunt motors have with them what is termed a field rheostat. This is a type of resistance so arranged that it can be connected in series with the shunt field coils. It is built up of resistance elements suitably connected within a fire-proof casing and arranged by means of contacts so that a greater or a lesser resistance can be used in series with the shunt coils. The use of it makes possible the variation in the strength of the current flowing through the shunt coil windings. In this manner the strength of the main magnetic field is varied by manual control. The greater the amount of the resistance cut into the field circuit the weaker the main field becomes, and the faster the armature will revolve. Conversely, as the amount of such resistance is decreased, the speed of the armature will decrease, the load remaining the same. If, however, it is attempted to increase the speed beyond a certain limit when the motor is fully loaded considerable sparking will appear at the brushes. Such a limitation is soon reached. The sparking results from a weakening of the main field to a point where the armature reaction so distorts the main field as to shift the neutral point beyond the line of commutation. Such a condition very quickly manifests itself. It can be alleviated somewhat by shifting the brushes, but in general it is unwise to attempt to push the speed to a point where such sparking begins to evidence itself.

The starting devices of street railway motors have already been rather fully described under the name of controllers. Shunt-wound motors are started differently, and the devices for the purpose have been termed starting boxes or starting rheostats. The controllers, diverters or resistances, armature and field coils of street railway or series-wound direct-current motors are in series with one another at starting. The same current strength passes through all of the elements. The shunt-wound motor has a circuit embracing the field coils and field resistance or rheostat in series with one another. The armature which is in series with the starting box forms a separate circuit. In starting such a motor, therefore, the first consideration is to make certain that the current is first turned into the windings comprising the field circuit. When this has been done, the current can be turned on the armature through its starting box, with the full resistance of the starting box cut in. This causes a lower voltage to be impressed upon the armature at starting. As the armature picks up in speed, the resistance of the starting box is gradually reduced by passing from notch to notch until all such resistance has finally been withdrawn from the armature circuit. The starting box is then virtually cut out, the armature is receiving the line voltage and running up to speed.

Failure to have the field current in the windings around the pole pieces at the time the armature circuit is closed will result in disaster. If the motor is to operate at a potential of 500 volts, the current would undoubtedly jump across the brushes. At this juncture, if a circuit breaker or a fuse failed to operate, the brush holder and commutator would probably be ruined, not to say anything of the resulting bodily discomfort to any one who might be near at the time. Five hundred volt direct current is a very vicious form of electrical energy when permitted to roam about under such circumstances. Similarly, if the field circuit should ever be opened when the motor is running without at the same time opening the armature circuit, the armature would immediately acquire such a speed that it would fly to pieces. Shunt motor starting boxes are designed to prevent accidents similar to those just mentioned. They have an arm pivoted at one end, the other end moving over the copper contacts. This movement reduces the resistance in series with the armature. Immediately such arm is started from the first contact, the current is first sent into the field circuit, after which the armature circuit is closed. This operative detail is so taken care of that it is impossible to start the motor in any other manner. After the armature is up to speed and as a result all of the resistance is cut out, the arm of the starting box has reached the limit of its movement; a small projection on the arm engages with the end of an armature of a small electro-magnet mounted on and a part of the box. The winding of this electro-magnet is in series with the shunt field coils. Therefore, when a current energizes the field coils the same current magnetizes the core of the small electro-magnet mentioned, as a result of which its armature is attracted and is kept engaged with the projection on the starting box lever, retaining that lever in the running position. If the current in the field is cut off for any reason, then the armature of the small retaining electro-magnet is released, thus freeing the starting lever. That lever is then immediately snapped back into the off position by means of a strong coil spring. This action takes place before it becomes possible for the motor armature to reach an abnormal rate of speed. The same kind of a starting box can be and is usually used with compound-wound direct-current motors.

The commutator of a dynamo or motor is such an important detail of the equipment that some extended description of it will be made. Hard forged copper segments are used in its construction. The segments are insulated from one another and from the shaft by layers of mica. The copper segments are laid side by side with the mica between so as to form a circle. These parts are clamped together and turned true in a lathe. When turned true, the segments and insulation are securely held together by a shell and collar arrangement, when it is ready to be keyed to the armature shaft and held in a fixed position with a lock nut device. The armature shaft is usually tapered where the commutator fits upon it.

The old style motors made use of copper brushes, whereas the practice for a number of years past has been to use carbon brushes only. Copper brushes had a higher current carrying capacity but were much more troublesome to keep trimmed and in such condition that they would not cause sparking. Carbon brushes have a much lower current carrying capacity, but in every other respect excel any other type of brush that has ever been employed for the purpose. Their lower current carrying capacity, however. necessitates a commutator of larger dimension in order that sufficient brush surface can be obtained.

Notwithstanding the fact that the carbon brush was the means of improving commutation, the commutator and accompanying carbon brush holder still remain the most important and most difficult parts of railway motor equipment construction. The work which a railway motor is called upon to perform is not only very exacting, but the conditions attendant upon the daily run are so very variable that not only must the very best materials be employed in building up a commutator, but refinements of workmanship utilized as well.

The load conditions of a street railway motor change quickly and through a wide range. Such changes bring about a rush of current through the armature, the brushes transmitting it to the commutator and the commutator distributing it throughout the windings. Both of these elements must handle the current without undue sparking and heating. This means that they must run true, that the brushes must always bear uniformly with full surface upon the commutator, and that both must be kept absolutely clean and free from any dirt or grit. Failure to maintain these elements in this condition brings about the injurious sparking which, once begun, is hard to prevent thereafter. The rapid deterioration of both brushes and commutator begins immediately. It then becomes necessary to dismantle the motor and remove the armature, placing the same in a lathe and truing the commutator. In doing this work in a lathe, a fairly high speed must be maintained and a hard and sharp tool must be used. Copper is soft and tough, so that great care must be exercised to prevent the cutting tool from carrying burrs across or partly through the mica insulation between segments. Such burrs are not infrequently the cause of break-downs between adjacent segments of a commutator.

The sparking between brushes and commutator may sometimes be traced to a rough condition of the commutator surface, to the fact that it may run eccentric, to a flat segment, one or more high bars in the commutator or to a piece of the mica insulation which may project somewhat above the surface of the adjacent segments. Any of these defects will cause the brushes to lose uniform contact with the surface of the commutator when the same is running at a high rate of speed. A lack of proper care in the assembling of commutator segments or the working loose of some of the nuts or screws which are used to hold the parts in proper form will bring about a flat segment. A commutator may run eccentric because the armature shaft becomes loosened from the commutator shell in some way. On account of the high rotative speed and the brush pressure, the commutator will tend to wobble. The whole armature might shatter as a result of the irregular brush contact. If the mica insulation between adjacent commutator bars is harder than the metal, the copper will wear down a little faster and as a result the brushes will be caused to vibrate and lose contact.

When a commutator is in good condition its surface will have a deep bronze polish, seeming as though glazed. It may have such a polished appearance and yet one or two bars may show that something is wrong. If we touch the commutator with the finger nail lightly held against it when running it will be possible to detect any roughness or irregularity in the surface. Similarly in the case of an eccentric commutator, if it be turned over slowly the brushes can be seen to move up and down, whereas the usual rotative speed of the armature will cause the brushes to chatter. Eccentric running or high and low bars may even be so pronounced as to enable one to see through between the brushes and the commutator surface. In examining railway motor and generator commutators care must be exercised in handling when the line voltage is on the machine. In such equipment one side of the circuit is always grounded, and it is a good precaution to see that one's self is effectively insulated from the ground.

In general, when sparking is due to any one of the causes just mentioned, there is no effective remedy other than removal of the armature from the motor and giving it proper attention in a lathe. Large generator or rotary converter armatures do not lend themselves to such methods of repair very readily. For machines of this class a slide rest or bracket arrangement is available for fastening to the outboard bearing. The commutator turning tool is placed on this slide and the commutator revolved at the proper speed either by turning over the engine or by other power conveniently applied. Only very fine cuts should be made and great care exercised in the performance of the work. A finish is made at a higher speed with carborundum or sandpaper and a dead smooth file. There are also grinding tools on the market which are used for a similar purpose to that of the lathe tool. These are built up for use on a lathe or for attachment to a generator bearing.

If the proper care is exercised when a commutator is first put in service it will not be difficult to get its color and polish. The first consideration is perfect contact between brush and commutator, so that the brushes bear uniformly around the full circumference of the commutator; then keep the commutator clean and make use of just enough vaseline or lubricating compound to keep it running smoothly and quietly.

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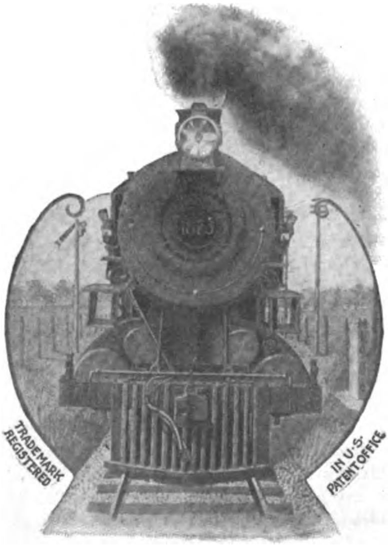

THE PYLE ELECTRIC HEADLIGHT

BY R. BRADEN

Considered probably the most valuable modern railroad invention in the world next to the Westinghouse air brake, in giving confidence to the engine crew and in the saving of life and property, is the electric headlight on the front of locomotives. Both of these devices originated in Indianapolis, but the air brake early went to Pittsburg and the headlight is now manufactured exclusively by a firm in Chicago.

George C. Pyle, who conceived the electric headlight in 1882, spent twelve long persevering years, through all the inventor's proverbial discouragements, in perfecting and completing his invention after he had made it. The improvements have gradually reduced the weight of the plants from 900 pounds to 350 pounds and their cost from $800 to $200. Scores of other electricians in different parts of the country have striven ever since to outdo Mr. Pyle's achievements, but have failed.

The immense four thousand candlepower lights which now bore their way like small suns into most of our railway stations, cast their reflection for thirty-five miles and illuminate the track thirty-three telegraph poles ahead of the engine, whereas only three poles can be seen at one time by the old-fashioned coal oil lamps. Thirty-two telegraph poles are accounted a railroad mile.

The modern apparatus has no gears, racks or wheels, no reciprocating parts or wearing surfaces of any kind requiring oil, except the bearings which run in oil. It can be put into the case of any headlight and its adjustment is arranged for vertical, horizontal and lateral motion. In case of an accident it can be removed and used to illuminate the surrounding country. Its carbons can be replaced in a moment. The upper stick is fed down through a clutch, the distance between it and the lower carbon being regulated by an electromagnet. The engine is run by steam from the locomotive boiler, while a stop-cock convenient to the engineer's hand starts or stops the light at will.

The light from the first electric lamp, which was tested on the New York, Pennsylvania & Ohio Railroad running east from Dayton, although inferior to that of subsequent lamps, was considered marvelous. Yet in eight years did no single headlight equipment get over the road without showing some defect in engine, dynamo or lamp. The earlier experiments included a small engine of the "brotherhood" type.

During the last one of these eight years Mr. Pyle rode more than thirty thousand miles at night, and nearly every mile on a locomotive. At the end of it he saw the company of stockholders who had been backing him, wearied by waiting, and discouraged by the expenditure of seventy thousand dollars without more definite results, go to pieces. Among them was the late Lewis Miller, father-in-law of Edison and inventor of the Buckeye reaper.

In the meantime electric headlights had been placed on such roads as the Panhandle, the Vandalia, the Michigan Central, the Burlington, the Erie and the C., H. & D., the Vandalia being the first to adopt them. A new company was formed, although it was three years more before the first really successful light was produced. The fact that a locomotive had gone over the entire length of the old Indianapolis, Decatur & Western road, about one hundred and fifty miles, equipped with an electric headlight which had worked perfectly seemed too good to believe. The locomotive returned the following night from Decatur to Indianapolis, and the headlight worked as perfectly as on the night previous. From that time success was assured.

Reporters frequently accompanied the early trial trips, and sights which are now familiar to every engineer were then "written up" in glowing terms.

"Three miles beyond is a curve," says one account, "and before the light proper came into view the sky was quite brilliantly illuminated, resembling somewhat the auroral light. Though the train was three miles off, a postal card was read and the time on a watch distinguished with ease."

Another report compares the approach of the electric light to the sunrise, and still another calls attention to the long line of telegraph poles which "resemble the pickets of a fence so far ahead could they be seen." Dogs, cats and rabbits visible on the track three-fourths of a mile ahead caused much comment.

With the exception of two roads in the East, electric headlights are now used on every railroad in the country and have also gone to Australia, South America and other parts of the world. Oddly enough they have not yet been introduced into Europe, the headlights there consisting mostly of small semaphores only six inches in diameter. Twenty-two patents in all have been taken out on this invention, which has saved hundreds of lives and millions of dollars worth of property.

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*Application of the Bilgram Valve Diagram to a Slide Valve Engine with a Fixed Eccentric.**

By means of the Bilgram Valve Diagram it is possible to obtain the position of the valve and the amount of port opening for any and all positions of the crank pin. A clear understanding of it will do more than anything else to make the action of the link motion, the changes produced in hooking up, or the variations introduced by moving the eccentrics, plain. The study of locomotive valve gears cannot be prefaced too early by the study of a good valve diagram. The one described here really consists of a working model of the valve gear, easily constructed by any one with compass and ruler. As the link motion followed the shifting eccentric, and as the effect produced by moving the latter is similar to hooking-up or lowering the link, and as the shifting eccentric was preceded by the fixed eccentric, the application of this diagram will first be considered in relation to an eccentric of the latter type. It is assumed that the reader has some knowledge of lap and the events of the valve stroke, admission, cut-off, release, and compression, still their significance in connection with a diagram may have been overlooked. Therefore a brief review is desirable.

Fig. 1 shows a valve having an amount of outside lap equal to *a* but no lead, and upon referring to Fig. 2, it will be noticed that the valve is line and line on the inside. Fig. 1 shows the valve moved from mid-position an amount equal to its lap, or it is on the point of opening or closing the port, depending upon the way it is moved, or when the displacement of the valve from its mid-position is equal to the outside lap, the valve is either at admission or cut-off, depending upon whether it is moving to open or close the port. This is a very important principle in the understanding of a valve diagram, and it should be carefully remembered.

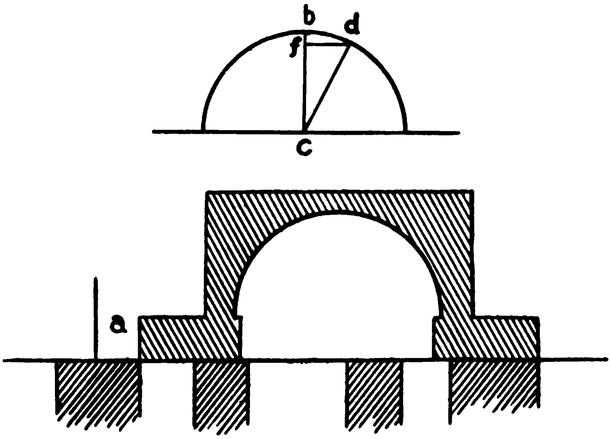

Fig. 1

Referring to Fig. 1, if the valve had no lap, the proper position for the center of the eccentric would be at *b*, but as lap exists, and as it is important that steam be admitted to the cylinder at least at the end of the piston stroke, or before it, if the valve has lead, but as no lead is supposed to exist in this case, in order to secure admission of steam at the proper point, the eccentric center must be turned to *d*, *df* being equal to the outside lap, or the valve displacement from mid-position. The angle *bcd* then formed is called the angle of advance, or it is the angular advance of the eccentric. As will be seen later, this is another important factor in the construction of a valve diagram. Fig. 2 shows the valve in mid-position, and it is obvious, were the piston now moving towards the right, and the valve therefore moving towards the left, that any further movement to the left from mid-position, would open the left steam port to the exhaust and would close the right port to the exhaust, the first event being release, and the latter compression. If the valve and piston were moving in the reverse direction compression would exist at the left port and release at the right port, or briefly, any movement of a valve which is line and line on the inside, from mid-position will result in release and compression.

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*By J. H.

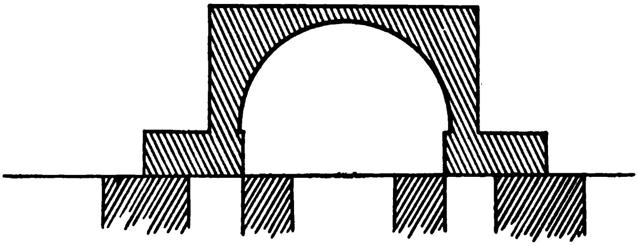


Fig. 2

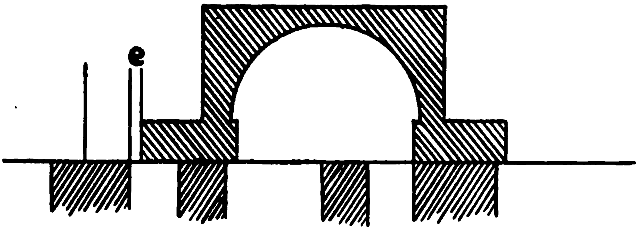


Fig. 3

Fig. 3 shows the port open to admission an amount equal to *e*, or the amount of port opening that exists for any position of the valve is equal to its displacement from mid-position, less the lap. This fact bears an important part in the understanding of a valve diagram.

It is upon the foregoing principles that proof of the Bilgram Valve Diagram depends, and we are now in a position to begin its construction. See Fig. 4.

Let *O* be the center of the axle, *A* the center of the crank pin, and *b* the center of the eccentric. This position corresponds to Fig. 1, although the two figures are drawn to different scales. *O b* is the angle of advance. As in Fig. 1, the center of the eccentric has been turned from *a* to *b*, displacing the valve from mid-position an amount equal to *ab* or to the lap, and as the engine is supposed to turn to the right the valve is at admission. Extend the crank arm *A O* to *B*, and from it locate the point *d* the same distance from *A B* as the point *b* is from *a O*. Draw *d c* at right angles to *A B* just as *b a* has been drawn at right angles to *a O*, *d c* being equal to *a b*, the line *dc* will also be the distance the valve has moved from its mid-position. Point *d* must be regarded as being stationary. Now imagine the crank pin moving from its dead center position, *A*, to the right to *K;* the perpendicular *de* on the extended crank arm line *K H* will then represent the total displacement of the valve from mid-position. Or, similarly, if perpendiculars be drawn from the fixed point *d* to any position of extended crank arm, it will represent the amount the valve has moved from its mid-position. Now by referring to Fig. 3 it will be noticed that the amount of port opening is equal to the distance the valve has traveled away from its middle point, less the lap, or the port opening is equal to *e*, and it follows that if the lap is measured off from the lines on the diagram representing the valve displacement from mid-position, the remainder will be equal to the port opening. The quickest way to do so will be to describe a circle, taking the point *d* as a center and the lap of the valve as a radius. Then *dc* will show the valve at admission, *ge* is the amount of port opening when the crank pin is at *K*, and *O f'* will be the greatest port opening. When the crank arm has turned to *O C* the displacement of the valve from mid-position is again equal to the lap, and as it is moving now to the left, position *C* of the crank pin will represent it at cut-off. When position *E* is reached by the pin the valve has traveled the amount of its lap on its left side to the left and is in mid-position, as in Fig. 2. Any further movement to the left will open the left port to exhaust, the amount being equal to perpendicular lines drawn on the crank arm from *d*. The same lines will show the amount the valve has closed the right port to compression. To avoid making the diagram confusing these lines are omitted, only the essential lines being drawn. When the crank pin reaches *B* the right port is at admission and the left port is open to the exhaust an amount equal to *dc*. For the stroke of the valve to the left *N* will be the crank position for cut-off; at *M* the valve is in mid-position, and at *A* admission is about to take place at the left port again. The solution of the following problem will help the student to fix the foregoing in his mind, after which he will be able to apply the diagram to a shifting eccentric and to the locomotive link motion, as their action is practically similar: Eccentricity of eccentric corresponding to line *cd*, Fig. 1, 2-inch, lap 1⅛ inches, line on line on the inside. Obtain port opening and the positions of the crank pin at admission, cut-off, release and compression for each end of cylinder.

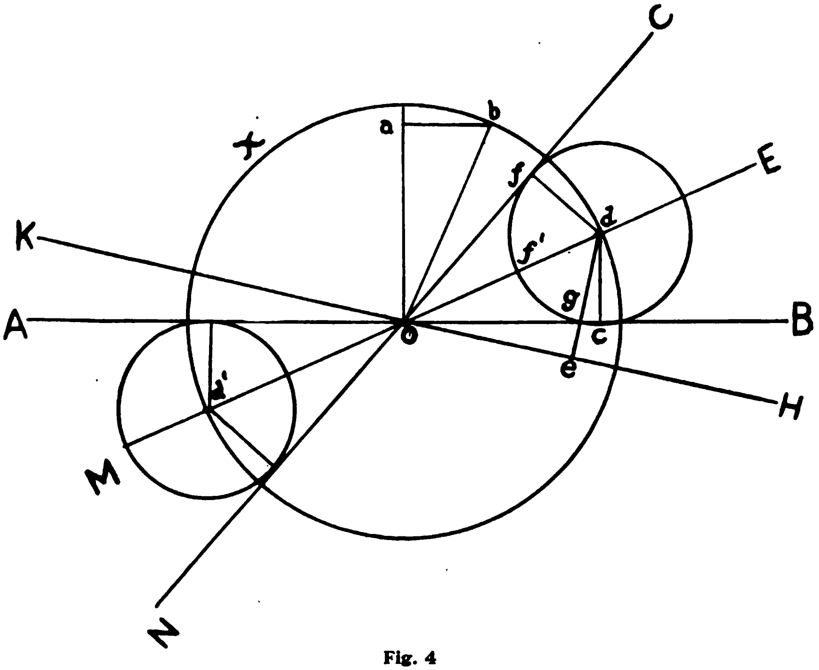


Fig. 4

MOVEMENT OF TRAINS

BY H. A. DALBY

Block Signal and Train Control Board.

The annual report of the above organization, which is a part of the Interstate Commerce Commission, shows considerable progress in the work assigned to it and gives promise of placing before the railroad men of America an array of facts which cannot fail to be valuable in their application to problems connected with the safe handling of trains.

This board was appointed by the Interstate Commerce Commission nearly two years ago to examine into the merits of the many safety devices which have been placed on the market, and the endeavor has been to obtain expert opinions from the best informed and most practical men directly engaged in the operation of trains. The duties assigned the board were to investigate systems of block signals, cab signals, automatic stops and any other devices or systems which are designed to contribute to the safe handling of trains.

The three devices mentioned have occupied most of their time, although various others have been considered. They report that they have examined 371 inventions of various kinds. Two hundred and forty-eight of these were block signals, cab signals or automatic stops, the remainder being devices of other kinds.

In order to obtain the best results it is necessary to proceed along strictly businesslike lines. After making a general examination of a particular device it is decided whether it merits further consideration, and thus far twelve which pertain to signaling and automatic stops have been reported as possessing sufficient merit so that the proprietors have been notified that the board will examine them if placed in actual working condition on a road where their operation can be plainly demonstrated.

With regard to the matter of block signaling, the board is sufficiently convinced of its value and of the fact that first class and efficient equipment is possible that the recommendation has been made to Congress that a block signal system of some kind be required by law on all roads or divisions where there are six passenger trains each way weekly. This would, of course, include all except remote branch lines in sparsely settled country. The installation of such equipment would, of course, be gradual, and a reasonable time would be allowed for its accomplishment.

Automatic Stops.—The value of these devices is not so easily determined. There are but few automatic stops in use in America, and their installation is not sufficiently extensive nor the weather and traffic conditions severe enough to demonstrate their desirability for general adoption on steam roads. They are in use on the elevated and subway roads of New York and Boston, in the tunnels under the Hudson River and on the city lines of Philadelphia. They are also used on the city roads of London, but the English mind does not, as a rule, hold the automatic stop in high favor. Its work is satisfactory on the roads mentioned, but it will be readily seen that it would not in these localities be exposed to severe storms, deep snows, etc., as it would if generally applied on roads in the open country. There are, indeed, two short installations on regular steam roads, one near Chicago and one in southern California, but the board reports that it has not made a sufficient examination of their merits to warrant including them in their report. Those places where the automatic stop is pronounced satisfactory are obviously no comparison to the conditions which must be met if its general adoption were recommended.

Members Visit Foreign Countries.—For the reasons named the board is of the opinion that our own country does not furnish opportunity for intelligent study of the automatic train stop, and the same is true of the cab signal, the latter being unknown so far as its value in actual practice is concerned. Both devices, however, are extensively used abroad, and for this reason two members of the board visited England, France and Belgium for the purpose of pursuing investigations more thoroughly than is possible at home. Their efforts, however, appear to have been disappointing in the sense of finding anything which they consider worthy of recommending for use on American roads.

A word of explanation in reference to the two devices mentioned might be in order. The "automatic stop," so-called, is a mechanical device located near the rail, and operates with the signal in such a way that when the latter indicates "stop" it will engage an arm or lever on the engine which shuts off the steam and applies the air, thus bringing the train to a stop. It is designed, as will be seen, to provide means whereby it will be impossible for a train to pass a stop signal even though the engineman should fail in his duty, either by oversight or by being disabled, instances of which are well known.

The cab signal is designed to give indication to the men on the engine either in addition to or in place of the regularly erected signals at the side of the track. Many advantages are claimed for it, and the day may not be far distant when it will be proven valuable and practicable. It has the advantage of being immediately before the eye of the engineman as well as the fireman and others who may be on the engine, it cannot be dimmed by storm or fog, and it gives its indication continuously from the time the engine enters the danger zone, thus reducing, if not obviating, the possibility of oversight or forgetfulness on the part of the engineman.

Both automatic stops and cab signals are in use in England and France, but it was not considered that the weather conditions, especially in France, could be compared to the severe strains to which they would be subjected here. Then, too, the electrical appliances are on the "open circuit" principle, which is contrary to all good rules for signaling, and naturally it would not appeal to the American mind as a commendable plan. The open circuit system, it may be explained, is one in which the electrical circuits are "open," or broken, when normal, and must be closed when it is necessary to give the danger indication. American practice is exactly the reverse. The circuit must be complete, wires and batteries in good working order if the indication is "clear." A break in the circuit indicates danger, and this is true whether actual danger exists or a defect occurs in the system. Perhaps these safety devices could be constructed on the "closed circuit" principle, but those examined by the board were not of that type.

It was the opinion, therefore, and so expressed in the report, that both the automatic train stop and the visual cab signal are yet in the experimental stage so far as application on American roads may be concerned, and accordingly no recommendation is made in regard to them.

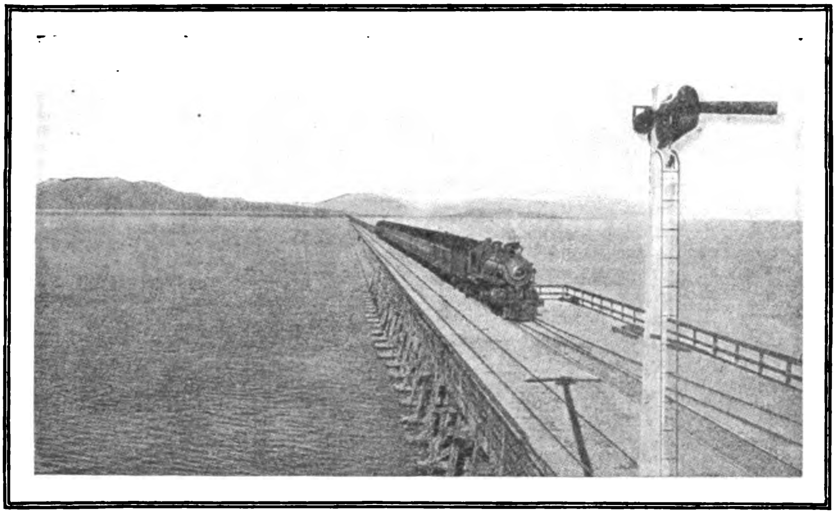
There has been brought to the attention of the board a cab signal and train stop device known as the Perry-Prentice signal, which is decidedly interesting to say the least. It works on the "wireless" principle, making use of the "Hertzian waves," and is, so far as known, the only attempt to operate a system of signals by this means. The board reports that it has made only a partial test of the system and is therefore not prepared to give out an opinion as to its practical value. Developments along this line will, however, be awaited with interest.

Various Forms of Telegraph Block.—The report makes some interesting observations on the telegraph block and the various improvements that have been made in recent years. It calls attention to the fact that during the past fifteen months the total amount of telegraph block protection has been considerably reduced. This has, without doubt, been to some extent the result of economy in expenditures owing to business depression throughout the country. In other cases it is possible that it has been replaced by a better method, such as the "manual controlled" or the automatic signals. As time goes on these systems will probably be adjusted and bring about general beneficial results. Block signaling in general, as shown by statistics for the year, shows a very satisfactory increase both in extent and efficiency.

The efficiency of the block service calls forth some comment, and it is noted that the personnel of the towermen is much improved owing to the decrease of the volume of business and the consequent opportunity for more careful selection of men. When traffic is heavy it is frequently necessary to employ men who are lacking in mature development and railroad experience. Conditions are not so pressing and the effect along this line is noticeable.

The observations of those who examined foreign methods resulted in a comparison between English and American systems of indication in connection with manual blocking which was decidedly in favor of the English method. The "needle" device is universally used, and the members of the board considered it superior to the ordinary methods for giving information to the block operator as used on American roads. The needle operates on the face of a dial and points at all times to the condition of the track in the block, and it was this feature that made a favorable impression as compared with the American method, in which the operator merely receives notice of the approach or entrance of a train by audible information, no permanent record being before him. It is true that this permanent information is provided in the best equipped lock and block systems, but with the ordinary telegraph block or the electric bell systems it is lacking.

A B C Rules and the Staff System.—The board gave very favorable notice to the A B C rules, so called, as used on the Northern Pacific, speaking in a complimentary way of the safety of the system as well as the promptness with which it is possible to move traffic on single track where they are in use. These rules, as is well known, provide a way which is nearly ideal for the dispatcher to handle trains, giving him opportunity to move them almost like checkers on a board, without the necessity of handling long train orders with consequent consumption of time and opportunity of misunderstanding and oversight. There are no train rules, no time table (except for advertising) and no train orders of the usual kind. A train leaving a telegraph office has a right to run to the next one and that is all. When it obtains permission to proceed it has absolute right of track. It is a positive block system with the addition that the dispatcher must authorize a movement, and he arranges meeting points as may be necessary. When a train approaches or is ready to leave a telegraph station the operator examines his block sheet, and if the block is clear he asks permission of the operator at the next station to allow the train to enter. If the latter is satisfied that the block is clear he gives the necessary permission and blocks all trains in the opposite direction. The first operator then asks the dispatcher if he may allow the train to leave, and the dispatcher, after satisfying himself that the block is clear, gives the necessary permission. Then the operator issues a clearance card to the train. Thus it requires the united action and consent of three persons be-



ONE OF THE CENTRAL PACIFIC'S "FLYERS" CROSSING THE GREAT SALT LAKE VIA THE FAMOUS "OGDEN-LUCIN CUT-OFF," BOUND FOR SAN FRANCISCO fore a train can move. A telegraph code of a few letters is used so that the operation requires much less time than it takes to tell it.

In the report a comparison is made between the A B C system and the staff system which shows the advantages of each. The electric staff system, which is used to a limited extent on single track, is so arranged that a train can only move when it has a staff in its possession. The staff is a bar of steel about a foot in length, and when not in use is kept in a case or magazine at either end of the block. These cases (one at each end of the block) are electrically interlocked with each other, so that only one staff can be out at a time, so that it is absolutely impossible for more than one train to have right to the track at a given time. This and the A B C system are quite similar with the exception that one is interlocked by electrical mechanism and the other by the co-operation of three men, each of whom is equally responsible for pronouncing the block clear and giving permission for the train to move. The staff system is expensive to install but easy to maintain, while the A B C costs an amount equal to the ordinary dispatching and telegraph service, with perhaps a little better equipment in this line than the ordinary dispatching district. Both systems received very favorable attention from the board.

The Telephone.—The report mentions the enlarged use of the telephone as a means of communication in block work and in train dispatching, remarking that it possesses many advantages over the telegraph and that it appears to be just as safe and efficient. It is interesting to note the extension of its use on many roads, and there is no doubt but it will supplant the telegraph in many places within the next few years.

Other Forms of Blocking.—Manual blocking and automatic blocking also receive attention in the report, and mention is made of the ever increasing installations of the latter system. Hundreds of miles of continuous track are now protected by automatic signals, and plans are prepared for much new work of this character during the coming year.

It would appear that the work of the commission must be of exceeding value in the examination and testing of these devices and can only result in better, safer and speedier handling of railroad traffic.

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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

718. Broken Valve Yoke.—"How can you detect a broken valve yoke or valve stem inside of steam chest, and what must be done in this case?"—*J. H. L.*

Answer.—If your engine stops with one side on the dead forward center and will not move in either direction the valve stem is broken short off at the yoke on the side that has stopped on the center, as in this case the movement of the valve stem will have pushed the valve ahead and opened the back port, and, as the stem is broken off, the valve cannot be pulled back; consequently the back port will remain open, admitting full boiler pressure behind the piston. As the piston must travel back before the engine can move in either direction, you can see that the engine cannot move, as the steam behind the piston prevents it from coming back. The usual standing test for a break of this kind as given in most books is "place the engine on the quarter on the side to be tested, open cylinder cocks, set brake, open throttle slightly and move reverse lever from full forward to full back gear; if the steam will shift from one end of the cylinder to the other, i. e., if steam issues from one cylinder cock with lever in forward motion and from the other with lever in back motion, you will know that the valve yoke is not broken on that side; if you cannot shift the steam, however, you will know that yoke stem is broken. Test the other side in same manner." But that is where you get up against it, as you cannot place engine on the quarter on the broken side; you will therefore find the first rule as given, viz., "if the engine stops on dead forward center on one side and cannot be moved in either direction, the valve yoke stem is broken on that side," to be best. If the yoke is only partly broken you can tell it by the exhaust, as you will get three normal and one light exhaust, thus: —— —— —— —. Watch the crosshead, and the side on which the light exhaust takes place when crosshead is leaving back center is the defective side.

Making repairs.—In case the valve yoke stem is broken off with an ordinary slide valve, disconnect the valve stem and push it up against the valve; now take out relief valve and push the slide valve back so as to cover the ports, then drive a wooden plug into relief valve long enough to go against the slide valve when relief valve is screwed in, replace relief valve, fasten valve stem with a clamp, slack front cylinder head so piston can be lubricated and proceed. In case the yoke is cracked, try to get in without disconnecting by working a long cut-off and a light throttle. If engine will not handle herself, however, disconnect and block as above. With a piston valve it is not necessary to clamp the valve; simply push it back to cover the ports, disconnect valve stem, slack cylinder head and proceed.

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719. Broken Tumbling Shaft.—"What would you do in case of a broken tumbling shaft or reach rod?"—*J. H. L.*

Answer.—If tumbling shaft is broken in the middle, or tumbling shaft arm that connects to reach rod, or reach rod is broken, raise the links to the height where engine can handle train by running a bar or a piece of timber under the tumbling shaft arms and resting on top of the frames and proceed. If only one of the tumbling shaft arms is broken off, remove the broken parts, block up the link to the right height by placing a block in the link between the link block and top of link, and proceed, being careful not to reverse engine without first changing blocking.

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720. Broken Link Lifter.—"What would you do in case of a broken link lifter or link saddle?"—*J. H. L.*

Answer.—Place reverse lever in forward or back gear, according to the direction in which you wish to move, and far enough down so as to be confident engine will start train in that notch, then block up the link having the broken lifter or saddle to the same height as the link on the good side, in the same manner as explained in answer to previous question, and proceed, removing broken parts in case they are liable to interfere. Do not reverse engine without first changing the blocking.

721. Broken Steam Chest.—"What would you do in case of a broken steam chest?" —*J. H. L.*

Answer.—If the chest is simply cracked, wedge the crack together by driving iron wedges, brake shoe keys will do, between the chest and the studs and proceed. If the chest is badly burst, disconnect the valve stem, cover the steam ports (where steam is admitted from the steam pipes to chest) by means of wooden blocks, clamping them down with the steam chest cover, then slack off on front cylinder head so piston can be oiled, and proceed on one side.

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722. Broken Piston Rod.—"Where is a piston rod most liable to break, and why?" —*J. H. L.*

Answer.—A piston rod held in the crosshead with a key is most liable to break in the key-way, as that is the weakest part and is also subjected to excessive strains in case the key is driven in too tight; piston rods held in crosshead by means of nuts on the end of the rod are most liable to break in the neck right at the crosshead fit, as that is the point at which vibration is arrested.

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723. Cylinder Packing Blow.—"How can you locate a blow in cylinder (piston) packing on a simple engine, Vauclain, cross and Schenectady compound?"—*J. H. L.*

Answer.—With a simple engine, place the engine on either quarter on the side to be tested, set driver brakes, open cylinder cocks, place reverse lever in either forward or back corner, open throttle; if steam blows from both cylinder cocks the cylinder packing is defective. For running test watch the crosshead; the blow will take place when the crosshead is leaving either end of the guides on the defective side, being loudest at the beginning of the stroke and gradually decreasing as the piston completes the stroke.

Testing Vauclain Compound.—Place engine on top quarter on side to be tested, set driver brakes and open cylinder cocks. To test high-pressure packing, place reverse lever in full gear forward, open throttle; if steam now blows from back low-pressure cylinder cock the high-pressure rings on that side are defective. To make this more clear, you must remember that with this type of engine no steam is admitted to the low-pressure cylinder until the piston has made one stroke, therefore with the engine standing no steam could get to low-pressure cylinders unless either the high-pressure packing or the valve rings were defective; to make sure it is the cylinder packing that is blowing, put reverse lever on the center; if the blow stops you can safely report cylinder packing; if it continues it is due to defective valve rings.

To Test the Low-Pressure Packing.—As stated above, no steam is admitted to the low-pressure cylinder until the piston has made a stroke. We must therefore in a standing test first get steam into the low-pressure cylinder before we can test the packing; to do this, leave the engine in the same position as above with engine on top quarter, reverse lever in forward motion. This admits steam to back end of high-pressure cylinder; now throw the lever in full back motion; this will allow the steam in the back end of the high-pressure cylinder to flow through the valve and into the front end of the low-pressure cylinder, therefore if you now get a flow of steam from both low-pressure cylinder cocks the low-pressure cylinder packing is defective. In both tests the starting valve should be kept closed. The test can also be made by simply opening the starting valve and not reversing the engine. Where the engine is equipped with indicator plugs it is preferable to remove one of these plugs instead of opening the cylinder cocks, as the cylinder cocks are located so close to the ground that it is a hard matter to see from which cock the most steam is escaping.

Running Test.—If the engine develops two loud exhausts on one side and has two normal exhausts from the other, thus, —— — —— —, the high-pressure cylinder packing is broken on the side from which the loud exhausts issue; if the engine develops two very light and two normal exhausts, or has but two exhausts and a blow, the low-pressure cylinder packing is defective on the side where the blow or light exhaust takes place. Always keep in mind that exhausts from either side take place when the piston on that side is at either end of the stroke.

Testing Cross-Compound or Schenectady Compound Engines.—Test same as a simple engine, except when testing the low-pressure side the engine should be cut into simple position. For running test, cut engine into simple, open separate exhaust valve; if engine blows in this position but not when cut into compound with separate exhaust valve closed, the high-pressure cylinder packing is defective; if engine blows, however, when cut into compound with separate exhaust valve closed the trouble is in the low-pressure cylinder.

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724. Main Rod Connections.—"Why are main rods connected to crank pin inside of side rods on an eight-wheel engine and outside of side rods on mogul and consolidated engines?"—*J. H. L.*

Answer.—As the main rod must impart the full power of the cylinders to the wheels through the main crank pins, it is always desirable to make the connection as close to the wheel as possible, for this reason eight-wheel engines or any other engine on which the main rod connects to the front pair of wheels have the main rod connection inside of the side rods or next to the wheel. Where there are one or more wheels connected ahead of the main wheel, however, the main rod must be connected outside of the side rods, as otherwise the crank pins ahead of the main pin would strike the main rod just before the engine got on either center, and therefore the engine could not move.

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725. Hot Pins.—"What most frequently causes hot pins, and how should they be treated?"—*J. H. L.*

Answer.—Deficient lubrication, grit or other foreign matter getting between the bearing surfaces. Rods keyed up too tight or allowed to run too loose, and brasses not properly fitted are the principal causes in the order named. The remedy must be according to the requirements. If deficient lubrication, supply the necessary quantity; if due to grit, increase the amount of lubrication; if due to being keyed too tight, slack off on the key; if to being run too loose, key it up, or if the key is down all the way, report brass reduced on arrival; if brass is poorly fitted, have it refitted on arrival.

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726. Eccentric.—"What is an eccentric?" —*J. H. L.*

Answer.—An eccentric is a name given to a disc or crank encircling a shaft or axle whose center does not coincide with the center of the axle or shaft which it encircles.

727. Position of Eccentrics.—"What should be the position of the eccentrics in relation to the main pin on direct and indirect engines?"—*J. H. L.*

Answer.—On an inside admission direct-connected engine the go-ahead or forward eccentric usually follows the pin at an angle of 90° less the amount necessary to overcome the lap and lead, while the back-up eccentric leads the pin an equal amount. With an outside admission direct-connected engine the go-ahead eccentric leads the pin at an angle of 90° *plus* the amount necessary to overcome the lap and the lead, the back-up eccentric following the pin at an equal distance. On an indirect engine with outside admission valves the go-ahead eccentric follows the pin at an angle of 90° less the amount necessary to overcome the lap and the lead, while on an indirect engine having inside admission valves the go-ahead eccentric leads the pin at an angle of 90° *plus* the amount necessary to overcome the lap and the lead, the back-up eccentric in the first case leading the pin and in the second case following the pin at the same distance that the go-ahead eccentric follows or leads the pin.

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728. Length of Eccentric Rods.—"How would you know if an eccentric rod was too long or too short?"—*J. H. L.*

Answer.—By the unequal exhausts. By watching the crosshead you can tell which rod it is, and if too long or too short. For instance, assuming you have an ordinary D or slide valve indirect-connected engine, if you note that the engine has an abnormally loud exhaust when passing the forward center on the right side and a less than normally loud exhaust when passing the back center, while the exhausts when engine is passing both quarters on the right side are normal, you will know that the right go-ahead blade is too short, because the exhaust that takes place when the engine is passing the right forward center is the steam from the back end of the right cylinder, and as the exhaust is abnormally loud you know that the valve must be admitting too much steam to that end. To equalize the steam it is therefore necessary to pull the valve back. As this is an indirect outside admission engine, you must, in order to pull the valve back, shove the link forward, and to do this you must lengthen the blade or eccentric rod. An easy rule to remember is: "With outside admission indirect-connected engines always move the blade toward the heavy exhaust." Another rule to remember is: "When the engine sounds square when worked at nearly full stroke in the forward motion, but is lame when hooked up, the trouble is in the back-up motion, and when square in full gear backing up but lame if hooked up, the trouble is in the forward motion." A little practice will soon enable any one to tell by the sound of the engine whether it is an eccentric rod or an eccentric that has slipped, and also locate which one and which way it has slipped.

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729. Hancock Inspirator, "Locomotive Type."—"Describe the Hancock inspirator."—*J. H. L.*

Answer.—The Hancock inspirator, "locomotive" type, is a modification of the Hancock inspirator, "stationary" type, adapting it to the requirements of a locomotive boiler feed. The Hancock inspirator for stationary purposes, as it was and is still made, soon after being put upon the market in 1876 was found to give such satisfactory results with its capacity to handle water within the reach of a good pump and in some cases beyond the reach of a pump, and to work so successfully through all the varying conditions of lift, varying steam pressures and varying temperatures of water that its designers were led to believe that its success as a locomotive boiler feeder would be as eminent.

In order to make a reliable and convenient boiler feeder it was necessary to concentrate the whole operation on one handle or lever. To accomplish this different types, different styles and combinations of valves were tried, and after years of trial and experiences on different locomotives in different parts of the country the present style locomotive inspirator was evolved, reducing the machine to as few working parts as possible and having all these parts accessible and of a durable and substantial character in design, material and workmanship.

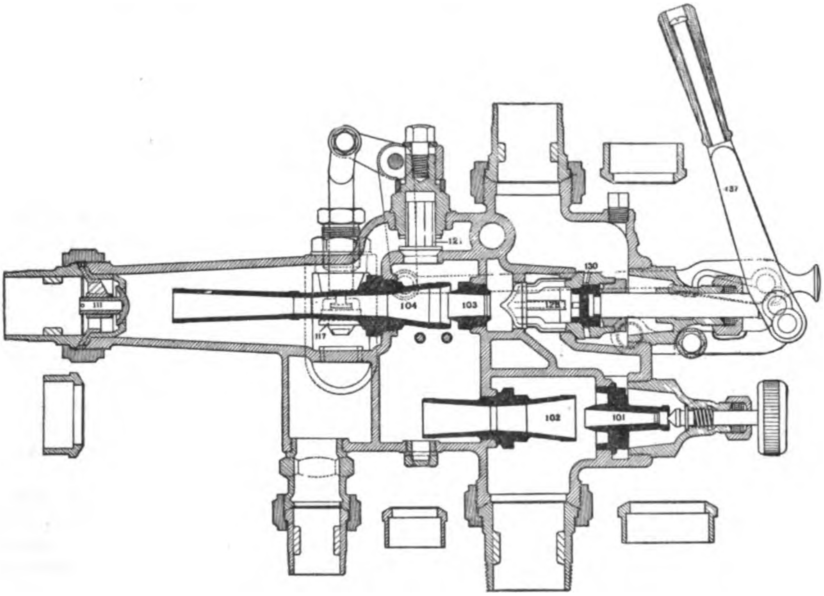
The inspirator differs very materially from the ordinary injector, consisting of a single set of tubes with in some cases an auxiliary priming device, inasmuch as the inspirator consists of a lifting apparatus and a forcing apparatus.

The function of the lifting apparatus is to lift the water and deliver the same to the forcing apparatus in proper quantities to suit the existing and changing pressures of steam; or, in other words, it acts as a regulator for the forcing apparatus. The proportions of the steam nozzle in the lifting apparatus to the throat of the combining tube are such as to allow of wide range or flexibility in operation under varying pressures of steam, the quantity of water increasing as the steam pressure increases, and consequently delivering to the forcing apparatus the increased quantity of water which is demanded of it as the steam pressure rises, and diminishing the quantity as pressure decreases, thus enabling the inspirator to work without any adjustment with pressures of steam from 25 to 350 pounds, the lifter taking care that it has the amount of water demanded for the varying pressures of steam. This condition enables the final overflow valve to be closed positively, so that all the water that is taken into the inspirator is delivered into the boiler.

The construction of the inspirator consists of a body containing a lifter tube *102*, and steam nozzle *101*, constituting the lifting apparatus, and a forcer combining tube *104*, and forcer steam nozzle *103*, constituting the forcing apparatus. These are screwed firmly into the body. The inspirator is provided with a final overflow valve *117*—which is worked by proper connections to the operating lever—and an intermediate overflow valve *121*, the office of which is simply to open and give free escape for the steam through it and the final overflow valve to enable a vacuum to be readily formed to lift the water. When water is lifted the function of the intermediate overflow valve ceases and it is closed and held to its seat by the pressure in the forcing chamber when steam is admitted to the forcing steam nozzle. There is also a steam valve in the steam chamber provided with an auxiliary steam valve, *130*, which communicates with the lifting steam nozzle, and it is provided with a cylindrical end which closes the opening or port leading to the forcing steam nozzle while water is being lifted.

The inspirator is also provided with a regulating wheel with spindle, which is used to reduce the quantity of steam entering the lifter steam nozzle in case the inspirator is required to feed a reduced quantity of water or down to its minimum capacity, and the inspirator will operate to a minimum of about 50 per cent. of its maximum, but in case the inspirator is required to work at its full capacity at all times this regulating wheel need not be used.

It might be asked why an inspirator or double tube injector is any better than the ordinary single tube injector. The single tube injector must be provided with an overflow valve which opens outward to the atmosphere to give notice that it needs adjusting when the pressure of steam changes, and as a rule they will not work without spilling at the overflow within a range of 30 to 40 pounds of steam without adjustment. If steam rises they require more water and will indicate it by escape of steam or steam and water at the overflow. If the steam drops to a certain pressure, water escapes at the overflow and to prevent this it must be regulated by giving less water or more steam. Some single tube injectors that will work successfully with steam pressures from 200 to 225 pounds are so constructed that they often fail to supply the boiler at all if steam drops to 150 or 100 pounds.



The Hancock Inspirator, No. 11, Type A.

OPERATION—To start the Inspirator, draw the Lever back to lift the water, then draw it back slowly to the Stop. When the Lever 137 is drawn back slightly, Steam is admitted to the Lifter Steam Valve 130 through the Forcer Steam Valve 126 to the Lifter Steam Nozzle 101. The flow of steam through the Lifter Combining Tube 102 creates a vacuum and causes the water to flow through the Lifter Combining Tube 102, condensing the steam, and out through the Intermediate Overflow Valve 121 and through the Final Overflow Valve 117 in the Delivery Chamber.

A further movement of the Lever 137 opens the Forcer Steam Valve 126, admitting steam to the Forcer Steam Nozzle 103 and to the Forcer Combining Tube 104 and creating a pressure in the Delivery Chamber sufficient to close the Intermediate Overflow Valve 121 and open the Intermediate or Line Check Valve 111.

The Final Overflow Valve 117 will be closed and the Inspirator in full operation when the Lever is drawn back to the Stop. When the Pin in the Wheel of the Regulating Valve is at the top, the Inspirator will deliver its maximum quantity of water. To reduce the feed, turn the Regulating Wheel to the right.

To use the Patent Heater Attachment, lift the Connecting Rod until disengaged from the Stud in the Lever; then draw back the Connecting Rod to close the Overflow Valve. Regulate the quantity of steam by the Lever without throttling the Main Steam Valve on the boiler.

If the Inspirator "break" or will not start promptly, see if there is a leak in the suction connections. If the openings into the Tank are too small, or the hose strainer clogged, or the hose kinked or its lining collapsed, the Inspirator will not get a sufficient supply of water. If the Inspirator will lift the water but will not deliver it into the boiler, see that the Check Valve on the boiler is in proper working order. If the openings in the Main Steam Valve or its connections are not of the required size, or there is a leak in the dry pipe, the supply of steam will be insufficient. If the Overflow Pipe is smaller than the Overflow Nozzle, there will be back pressure, which will interfere with the proper working of the Inspirator.

There are other types of locomotive injectors with double tubes or with a lifting and forcing set, but these are also provided with overflow openings to the atmosphere to allow for starting, and they will work through the varying pressures without adjustment up to 200 to 250 pounds, but they also possess the quality of working and delivering the water entirely out of the overflow should there be an obstruction in the delivery or the check valve stuck, and this at times when it might not be observed by the enginemen, the results of which might in some instances be very serious.

An instrument for feeding locomotive boilers should be of the most reliable character. It should be able to take its water under such conditions as would exist from having a leaky steam valve or water in the tender overheated by too long continued blowing back and to inject it into the boiler without hesitating to a degree that would give the engineer the least anxiety. It should be able to take water at a temperature of 125 degrees with as high as 200 pounds of steam and it should have a range of capacity to successfully feed down to about 50 per cent. of its maximum.

The Hancock inspirator, "Locomotive" Type E, it is claimed, will fulfill the requirements as heretofore enumerated and is designed to take tubes ranging in capacity from 2,500 gallons to 5,000 gallons per hour, thus enabling a motive power department to adapt this type to different size engines without change of connections, and if the capacity of an inspirator when first installed is found to be too small or too large, new tubes of the required capacity can be inserted.

In equipping a locomotive it is considered necessary to select the size of inspirator required by the maximum quantity of water it is capable of supplying the engine under all conditions of its service, and if its capacity is not in excess of the maximum requirements it can be easily regulated to supply the engine when handling a light load and can be run constantly maintaining a regular feed for any distance between stops.

All types of Hancock locomotive inspirators possess the same qualities, varying only in their construction to meet different pipe connections and to the extent that different size tubes may be inserted in the same case.

The accompanying illustration represents the Hancock inspirator, "Locomotive" Type A, which shows in section the construction of each of the several parts.

730. Effect of Pressure on Temperature of Steam.—"How does increasing the pressure affect the temperature at which water boils? The latent heat of evaporation, and the total heat?"—*J. H. L.*

Answer.—Whenever the pressure of saturated steam is changed, there are other properties that change with it. These properties are the following:

First. The temperature of the steam, or what is the same thing, the boiling point.

Second. The number of British thermal units (B. T. U.) required to raise a pound of water from 32° (freezing) to the boiling point corresponding to the given pressure. This is called the heat of the liquid.

Third. The number of B. T. U. required to change the water at the boiling temperature into steam at the same temperature. This is called the latent heat of vaporization, or simply the latent heat.

Fourth. The number of heat units required to change a pound of water at 32° to steam of the required temperature and pressure. This is called the total heat of vaporization, or the total heat. It is therefore plain that the total heat is the sum of the heat of the liquid and the latent heat. That is, total heat = heat of liquid + latent heat.

All the above are different for different pressures, as has been determined by direct experiment for all ordinary steam pressures. Thus, if steam boils under atmospheric pressure the temperature is 212°; the heat of the water is 180.531 B. T. U., the latent heat, 966.069 B. T. U., and the total heat 1146.6 B. T. U. With the pressure at 70 pounds above vacuum the temperature is 302.774°, the heat of the water is 272.657 B. T. U., the latent heat is 901.629 B. T. U., and the total heat is 1174.286 B. T. U. The variations of temperature and pressure can be obtained from any steam table.

731. Measuring Steam Pressure.—"How is steam pressure measured?"—*J. H. L.*

Answer.—Steam pressure is measured by means of an instrument designed for that purpose and called a steam gauge. See answer to question 641, page 374, September, 1908, issue, which instrument records the pressure of the steam above the pressure of the atmosphere.

732. Expansion of Steam.—"What is meant by expansion of steam?"—*J. H. L.*

Answer.—Steam is an elastic gas generated by the application of heat to water. The greater the amount of heat imparted to a certain quantity of steam the greater the expansive force of the steam, consequently if the body of steam to which the heat is being applied is confined to a tight vessel, such as a boiler, its pressure must naturally be increased in proportion to the amount of heat imparted to it. If now this steam is allowed to flow from this vessel into another, as from the boiler to the cylinders, it being under compression, it will naturally expand and fill the second vessel, but if the supply is cut off before the second vessel is filled the pressure will be reduced in proportion to the size of the vessel into which it is expanded. As for instance, a pound of steam at atmospheric pressure (14.7 pounds) occupies a space of 26.37 cubic feet, while at 70 pounds pressure a pound of steam has been compressed into a space of but 6.076 cubic feet. If now this same pound of steam were allowed to flow into another vessel of 6.076 cubic feet capacity by means of a pipe connecting the two, it would expand and fill the second vessel also, but the pressure in each vessel would be but 35 pounds. In locomotive practice, for instance, the valve cuts off the admission of steam to the cylinder before the piston has completed its stroke; the steam that has been admitted to the cylinder prior to cut-off, however, continues to expand and force the piston forward or back, as the case may be, its pressure gradually decreasing as its volume, i. e., the space it must fill, increases.

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733. Closed Steam Valve on Lubricator.—"If the steam valve of the lubricator is closed while the engine is working steam, what will occur and why?"—*J. H. L.*

Answer.—The lubricator would stop feeding, or if it did continue to feed the oil would not reach the steam chest, because with the steam valve closed the steam pressure from the steam chest would flow up the tallow pipes, and with no steam in the lubricator the pressure would be unbalanced; again, as there would be no circulation of steam in the tallow pipes, i. e., as the steam from the chest that is forced up into the tallow pipes would be in a state of rest it would be condensed into water and held in suspension just above the steam chests; any oil that would now flow from the lubricator would remain on top of this water seal and so be prevented from getting into the steam chest until the engine was shut off.

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734. Nathan Bull's Eye Lubricator.—"Describe the Nathan Bull's Eye Lubricator."—*J. H. L.*

Answer.—The new Nathan Bull's Eye Lubricator differs from the old style lubricators in many particulars, principal among them being the elimination of the tubular glasses and feed arms, thereby producing an instrument that can be safely relied upon in these days of high-pressure steam with its increased strain of wear and tear. The lubricator proper consists of the oil reservoir with the condensing chamber mounted above it; the old style feed arms are replaced by feed arms cast with the body of the lubricator and forming an integral part of it, thereby eliminating the possibility of these arms becoming loose, and, as has happened, blowing out. The old type of tubular feed glasses are replaced with heavy glass discs securely packed into the lower and side extensions of the lubricator, which form the feed arms. The equalizing pipes, which equalize the pressures between the lubricator and the steam chests, are located in the condensing chamber same as in all other lubricators, while the feed valves are placed in the feed arms same as in other types. The only essential points of difference so far as the general working principles and operation of this type and the older or tubular glass type are concerned are, as stated above, the increased safety and decreased liability of failure due to casting the feed arms solid with the body of the lubricator and substituting disc for tubular glasses. The general descriptions covering the working of the sight feed hydrostatic lubricators, published in previous issues, apply to the Nathan Bull's Eye, also.

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735. Crosby Pressure Recording Gauge.—"Explain operation of Crosby pressure recording gauge."—*J. H. L.*

Answer.—As can be seen by reference to Fig. 1, the Crosby pressure recording gauge consists of a clock mechanism surrounded by a Bourdon tube, this tube expanding and contracting, i. e., having a tendency to straighten out and then again resuming its natural shape with each variation in pressure, as explained in answer to question 633, page 215, August, 1908, issue of the Magazine. Instead of having a clock dial, however, on which the pointer indicates the amount of pressure carried, a card is mounted on the clock shaft and is revolved by the clock mechanism, the recording pointer being fitted with a pen point held against the card, thus marking the pressure carried on the card as the card is revolved. The recording pointer instead of having a circular or clock-wise movement, as obtains with the ordinary pressure gauge, has an inverted pendulum movement, moving from right to left as the pressure increases. The card is spaced off into four periods circumferentially, and into 20-pound concentric rings or spaces, diametrically. Consequently as the card dial is revolved by the clock mechanism the pressure during each period of time is recorded by the pen point on the gauge hand or pointer. Fig. 2 shows the card dial, together with the recording pointer.

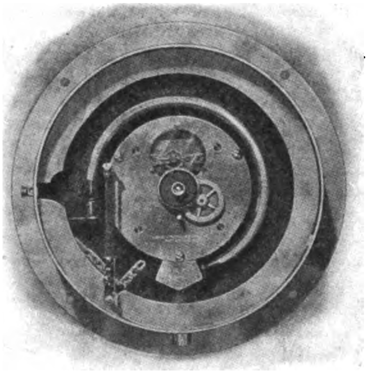

Fig. 1

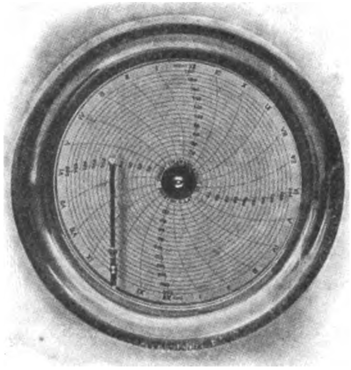

Fig. 2

736. Valve Gear, Class 1800 and 2500 Erie Locomotives.—"Could you please advise me if the Class 1800 and 2500 engines in service on the Erie Railroad are direct or indirect connected?"—*G. R.*

Answer.—The 1800 class engines are indirect connected and the 2500 class are direct connected.

737. Increase of Lead, Stephenson and Walschaert Valve Gears.—"Will you kindly inform me through the columns of the Magazine how the lead of a Stephenson link motion engine increases as the reverse lever is hooked up toward the center of the quadrant, or, in other words, when the engine is working in a short cut-off, and why lead does not increase with the Walschaert valve motion when reverse lever is hooked up toward the center of the quadrant and engine is working in short cut-off?"—*W. B.*

Answer.—With the Stephenson valve gear the movement of the valve in certain positions of the reverse lever is controlled by both eccentrics, as with this type of gear two eccentrics are necessary, one for the forward and one for the backing motion. With the reverse lever in full forward gear the go-ahead or forward eccentric alone governs the movement of the valve, and with lever in full back gear the back up or backing eccentric alone governs the valve movement. As both eccentrics must be advanced toward the pin in order to overcome the lap and to give the valve the lead required, it is plain that a part of the angular advance given to each eccentric will be imparted to the valve through the link and rocker arm. For instance, assuming the engine to be standing on the forward center with reverse lever in full forward gear; in this position, as stated above, the forward eccentric alone governs the valve; this eccentric, as stated, has been advanced from a point at right angles to the crank pin toward the pin, an amount sufficient to overcome the lap of the valve and give the engine the required lead, the back-up eccentric has of course been advanced an equal amount. Now, as in full forward gear the forward eccentric governs, while in full back gear the backing eccentric governs, it is plain that as the lever is moved toward the center the movement of the valve is gradually being thrown under the influence of the other eccentric, and part of the angular advance given the other eccentric is imparted to the valve through the link and rocker arm as above stated, and in this manner increasing the lead.

With the Walschaert gear, however, but a single eccentric is used (we will call the return crank an eccentric, as its functions are exactly the same); this eccentric or crank, however, has nothing whatever to do with the lap or the lead, it simply giving the valve the required travel. The lap of the valve is overcome and the required lead imparted to the valve by a separate and distinct lever, called the lap and lead lever, and connected at one end to the crosshead and at the other to the valve stem, and being so proportioned that a travel of the crosshead from one end of the stroke to the other will move the valve a distance equal to twice the lap of the valve plus the lead given; as the crosshead always travels the same distance in making a complete stroke, it is plain that the lap and lead lever must also have a constant travel and consequently impart exactly the same movement to the valve, regardless of the position of the reverse lever, and thus maintaining the lead constant. For a more thorough explanation of the Walschaert gear and the influence of the lap and lead arm we would suggest a careful perusal of the paper on the Walschaert Valve Gear by C. O. Rogers on page 499, October, 1908, issue of the Magazine.

STATIONARY PRACTICE.

738. Setting Valves.—"Please give the simplest way of setting a D slide valve on a stationary engine."—*T. B. M.*

Answer.—Assuming first that the engine in question has but a single eccentric and no link, the simplest way to set the valve without the use of trams, etc., will be to take up the steam chest cover so the movement of the valve can be fully observed. Now turn the fly-wheel until the crosshead is at its extreme travel, that is, until it is at the extreme end of one of its strokes, say the forward end, and note the position of the valve in relation to the steam port at that end of the cylinder; make a mark on the inside of the chest, if necessary, so you can remember exactly where the valve stood with the crosshead at the front end of the stroke; that is, if the valve has the port entirely covered; in case the port is not entirely covered, however, measure the amount of opening and mark it down; now turn the fly-wheel until the crosshead is at the other extreme end of the stroke, and note the position of the valve in relation to the other steam port; if you now notice that the travel of the valve is not equal, that is, if it travels farther over one port than over the other, lengthen or shorten the valve stem or valve rod as required until the travel is equalized, that is, when the piston or crosshead is at either extreme end of the stroke you will have exactly the same lead opening as at the other end of the stroke, or, in case the valve is set without lead, that the valve will overlap the steam ports an equal amount at each end of the stroke. If the engine has no lead and lead is desired, place the engine on either dead center after the valve stem has been adjusted to the proper length, so that the travel of the valve is equalized as above, and move the eccentric until the right lead is obtained. With an engine with but a single eccentric, and the eccentric rod connected direct to the valve stem without a double rocker arm, in order to give the valve more lead you would move the eccentric away from the crank pin; if the engine has a double rocker arm which reverses the motion, move the eccentric toward the crank pin to get more lead. In case the engine has two eccentrics and a link for reversing the motion, place the reverse lever in full forward gear and equalize the go-ahead or forward blade first, revolving the engine forward while doing so, then place the reverse lever in full back gear and revolving the engine backward equalize the back-up blade. Remembering that the blades (or valve rod on a single eccentric engine) only govern the cut-off, that is, equalize the cut-off in both ends of the cylinder, while the eccentric governs the lead. You can not give an engine lead by moving the blades or the valve rod, neither can you equalize the cut-off by moving the eccentric. The method outlined above will enable any one to set a valve so the engine will do business. In case a finer adjustment is desired it will be necessary to catch the exact centers by means of trams.

The Westinghouse Air Brake.

Answers by F. B. Farmer.

436. Straight-Air Leak.—"With the combined automatic and straight-air apparatus what will cause a blow at the exhaust opening of the straight-air brake valve when it is in release position?" —*A. J. D.*

Answer.—Either a leaky application valve or leaky shaft washer in the straight-air brake valve. It is more likely to be the application valve, due to its leather seat needing to be replaced.

One type of this brake valve has an extra connection and an additional quadrant position. With this valve the driver brake can be released when applied automatically, as well as when applied straight-air. With it there is an additional valve, the driver brake release valve, subjected to pressure when the brakes are applied and which can, therefore, cause the leak described.

437. Hole in Quadrant of G6 Brake Valve.—"Why is a small hole drilled in the quadrant of the G6 and other brake valves, the hole just past the service position notch?"—*A. J. D.*

Answer.—This hole is not put in brake valves now, but was at one time and was provided as a means of discouraging the unnecessary use of emergency position. The plan followed was to drive a small lead pin into this hole, the free end of the pin projecting about one-quarter inch. The use of emergency position would cause the handle spring to break off the pin. Instructions required a report for every such case, with reason for use of emergency and also a separate report requesting a new pin applied.

438. ET Equipment Tests.—"With the ET equipment how would you test for a leaky rotary valve (a) in the independent brake valve, and (b) in the automatic brake valve?"—*J. C.*

Answer.—To test for these and other leaks with the No. 5 ET equipment proceed as follows:

First, to ascertain whether there are any leaks to locate, place the handle of the automatic brake valve in holding position, make a light application with the independent brake valve, move its handle to lap and then watch the brake cylinder gauge hand for about a minute. If it remains in practically the same position all is well so far.

A regular and slight raising and lowering of this hand indicates the operation of the distributing valve application parts in supplying brake cylinder leakage. If the application parts do not work freely, as if dry and gummy, it will be indicated by a gauge hand fluctuation of several pounds, the amount increasing with the resistance.

As soon as the pump has fully restored the pressure drawn from the main reservoir by the brake application a very definite idea can be gained of the amount of brake cylinder leakage by noting how much faster the pump runs than before the brakes were applied.

Next move the handle of the independent brake valve to running position and again watch the gauge hand indicating brake cylinder pressure. The difference over the previous test is that the piece of the application chamber pipe that joins the two brake valves is now connected with application chamber pressure and can also affect the brake cylinder pressure if there is a leak from or one into it.

If, while the independent brake valve was on lap, the brake cylinder pressure continued to reduce, the distributing valve exhausting at the same time, there is a leak from the pressure that moved the application piston when the brake was applied, termed application chamber or application cylinder pressure. Look for such leakage at the application cylinder cover, at the application chamber plug, from the pipe connecting the independent brake valve with the distributing valve and from the double-heading pipe (double-heading cock to distributing valve). If the cylinder pressure does not leak down with the independent brake valve on lap, but does with it in running position (automatic brake valve in holding position) there is a leak from that piece of the application chamber pipe that connects the two brake valves.

If, instead of leaking down, the brake cylinder pressure increases under these conditions, then there is a leak into the application chamber pressure. To locate the leak disconnect the double-heading pipe at the distributing valve. It is the lower of the three pipes on the left side, facing the valve. Now, using a finger, close the free end of the pipe for half a minute and then note if any pressure has accumulated. If so, the double-heading cock is causing a leak from the brake pipe into the application chamber.

Next close the pipe connection at the distributing valve reservoir the same way. If pressure accumulates, recouple this pipe and disconnect the application chamber pipe, the next one above, then follow the same plan of closing one opening and then the other. If pressure accumulates on the distributing valve side the fault is a leaky equalizing valve, but if on the pipe side it is a leak from one or both rotary valves. Lapping the independent brake valve, heretofore in running position (automatic brake valve in holding position), will stop the leak if from the rotary of the automatic brake valve.

The object of keeping the automatic brake valve in holding position during these tests is to (1) keep the application chamber pressure from escaping and causing release of the engine and tender brake while the independent brake valve is in running position, and (2) to keep the brake pipe pressure from leaking down, as, if the latter occurred, the brake cylinder pressure would increase for the same reason that it does when the brake pipe pressure is purposely reduced in applying brakes. In fact, it is possible for a feed valve to vary sufficiently in its regulation of brake pipe pressure as to, with brake pipe leakage, cause an increase in brake cylinder pressure with the automatic brake valve in holding position. The latter differs from running position alone in closing the ordinary outlet from the application chamber to the atmosphere.

Bear in mind that brake cylinder leakage, including that from engine and tender brake cylinders and their pipes, will not be indicated by the brake cylinder gauge under normal conditions, but instead by the increased pump work with the locomotive brakes set by the independent brake valve, compared with when they are off. For this gauge to show such leakage, place and leave the handle of the independent brake valve in application position, close the cut-out cock in the supply pipe to the distributing valve (this pipe is the upper of the three at the left side of the distributing valve) and then watch the brake cylinder gauge, as it will then show such leakage. To tell whether any such is from the driver or the tender brake cylinders, first test with the tender brake cut out and then with the driver brake cut out.

439. 8½-inch Cross-Compound Air Pump.—"Describe the Westinghouse cross-compound air pump."—*J. C.*

Answer.—It consists of a low-pressure air cylinder and a high-pressure air cylinder in one casting; a high-pressure steam cylinder and a low-pressure steam cylinder in another casting; a center piece to connect these two castings and having stuffing boxes for the two piston rods; and an upper head for the two steam cylinders, in which head, and over the high-pressure air cylinder, is all of the valve motion except the reversing rod, which latter extends into this steam cylinder and is operated the same as are similar rods in other Westinghouse air pumps. The center piece forms the lower head for the steam cylinders and the upper head for the air cylinders. The lower head for the latter is a separate piece.

The high-pressure steam cylinder is over and operates the low-pressure air cylinder, while the low-pressure steam cylinder is over and operates the high-pressure air cylinder. The main valve, operated by the reversing valve, is of the piston-valve type. The diameters of the cylinders are (1) high-pressure steam cylinder 8½ inches, (2) low-pressure steam cylinder 14½ inches, (3) low-pressure air cylinder 14½ inches and (4) high-pressure air cylinder 9 inches. The stroke of all is 12 inches. There are four air valves at each end of the air cylinders, one receiving (same size as for the 11-inch pump), two intermediate discharge valves (each same size as with the 9½-inch pump) located in the passage between the low and the high-pressure cylinders and (4) a final discharge valve of the same size as the receiving valve.

Assuming all main pistons in their lower position, the reversing valve being thereby drawn down, and the pump steam will first be admitted to the lower end of the high-pressure steam cylinder, driving its piston and that of the low-pressure air cylinder, the larger one, upward. The air above the latter will be compressed and driven past the intermediate discharge valves into the high-pressure air cylinder.

At the completion of the up-stroke of the high-pressure steam piston it will raise the reversing valve. This will cause the main valve to reverse its position and, while admitting steam to the high-pressure steam piston to drive it down and repeat, in the reverse direction, the operation just described, it also connects the lower end of the high-pressure steam cylinder with the lower end of low-pressure steam cylinder. Here, acting over the larger piston, it will drive it up, the piston of the high-pressure air cylinder being drawn with it. At this time the upper end of the low-pressure steam cylinder is connected to the atmosphere.

This upward movement of the high-pressure air piston will compress the air discharged into its cylinder by the up stroke of the low-pressure air piston and compress it to that in the main reservoir, into which it is discharged. When the high-pressure steam piston completes its down stroke it will pull the reversing valve to its lower position, which will cause the main valve to reverse and repeat the operation just described, but in the reverse direction.

The capacity of this pump is about the same as that of three 9½-inch pumps, yet in compressing this amount of air it uses about one-third the quantity of steam as would the three 9½-inch pumps. It is designed for boiler pressures of not less than 160 pounds.

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440. Co-Efficient of Friction.—"What is meant by coefficient of friction and how is it determined for different speeds?"—*J. C.*

Answer.—This is a term used to indicate what proportion or percentage of the pressure applied to a brake shoe, for illustration, is developed into actual holding power. Suppose we had a brake beam at the same height from the rails as the car axle, that the hangers were vertical and extended through the floor and into the car, that the car were run in the direction that would cause the brake shoes to pull down on the hangers when the brake was applied and that we had the hangers connected to something on the order of scales so we could measure exactly the amount of this downward pull. Now, having just balanced the weight of the brake beam, heads, shoes, etc., and with the car running, say, 60 miles per hour, assume that the brake was applied heavily enough to put 2,000 pounds pressure on this beam, or 1,000 pounds on each of its brake shoes, and that this pressure on the beam was held exactly the same until the car stopped.

Now, if the scales showed that right after the brake application each brake shoe was pulling down with a force of 100 pounds, as the result of the friction between the shoe and the wheel, due to the 1,000 pounds pressure on each shoe, then the actual holding power of each shoe would be 100 pounds, or only 10 per cent. of the 1,000 pounds pressure that caused it. Therefore, the coefficient of friction at this time would be 10 per cent.

The lower the speed the higher is the coefficient of friction, or, stated differently, the more actual holding power is obtained from the same pressure of the brake shoes against the wheels. Hence, it would be observed that as the speed decreased the pull on the scales would increase and would be greatest just before the stop, assuming the wheels did not slide. When the speed had got quite low the pull of each brake shoe on its hanger would likely have increased to about 250 pounds, being one-fourth, or 25 per cent., of the pressure on the shoe. The coefficient of friction then would be 25 per cent.

The coefficient of friction, always a decimal, is the amount of frictional resistance between two surfaces (usually considered when in motion) divided by the pressure forcing one against the other.

The coefficients given in the illustration are fairly representative of the large variation due to high and low speeds, which goes far toward explaining the need of a high-speed brake for fast trains; why such shocks result from heavy applications at low speeds; why wheels are slid when speeds are low and not when they are high; why a train that can be controlled safely at low speed down a steep grade will run away if the speed is allowed to get high; and other conditions frequently met with in the use of brakes.

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441. Brake Shoes with Inserts.—"Why are some brake shoes made with inserts?" —*J. C.*

Answer.—An "insert" in a brake shoe consists of a different material, such as pieces of steel, placed in the mold and about which the cast iron is run. The object is (1) to prolong the life of the brake shoe by reducing the wear for a given amount of brake work, and (2) to increase the tire dressing effect of the brake shoe on the top of the wheel flange and on the outer portion of the tread, the parts not worn by the rail, so as to aid in maintaining the proper contour of wheel tread and flange.

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442. Flanged Brake Shoes.—"What advantage is claimed for flanged brake shoes?" —*J. C.*

Answer.—A "flanged" brake shoe is one that "lips over" and has a bearing on the wheel flange, in addition to that on the tread. The object sought is to wear down the top of the wheel flange at the same rate as the tread. On cars such shoes are not generally favored. One reason is the undoubted tendency toward increased wheel sliding, this having been proven by fitting a car with such shoes on one truck, plain shoes on the other and noting what wheels were slid and as well the lengths of flat spots.

There are different theories as to why flanged shoes on car wheels, all else being the same, increase the amount of sliding, one being that their larger bearing area increases the coefficient of friction; another is that their action on the flange, being farther from the wheel center than is the wheel tread, gives them greater leverage on the wheel; still another that the arbitrary spacing of them by the brake beam and this not always conforming to the distance between wheel flanges, causes more or less of a wedging or binding action; also, that they are more readily and firmly frozen to the wheels in cold weather than are plain shoes.

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443. Lost Piston Travel.—"How is lost piston travel determined?"—*J. C.*

Answer.—"Lost piston travel" is a term employed to indicate the increase resulting in a brake application over that required to just bring the brake shoes in full contact with the wheels. For example, if a light brake application were made of a car brake, all brake shoes were examined and found to be in full contact with their wheels, the piston travel was then measured, the brake then fully applied and the piston travel measured again, the difference would be the lost piston travel.

Having noted the piston travel obtained with a full service, standing brake application, if similar application could next be made with the car running, say, at 45 miles per hour, held applied to the stop and the piston travel again measured it would be found still longer. This latter is termed the "running piston travel." The difference between it and the piston travel from a similar brake application is also, properly speaking, lost piston travel.

Lost piston travel is a detriment in brake work, making both application and release of brakes slower, wasting air and, where running piston travel is correctly maintained, decreasing the shoe clearance in brake release and causing the train to pull harder.

As the really important brake work is done when the train is running it is the running piston travel that should be regulated, particularly with passenger equipment cars, as they have the greater amount of lost piston travel and carry the most valuable burden.

As lost piston travel and running piston travel, compared with standing travel, vary with different cars the only way to maintain the piston travel properly is with an automatic slack adjuster, one that will regulate the running piston travel. Many railway men have been surprised, on fitting a car with an automatic slack adjuster that could not operate until the piston had traveled eight inches, to find that the car would, at the end of a trip, come in with six inches and even as low as five inches piston travel, obtained from a full service *standing* brake application. This meant, where the standing travel was six inches, that the increase with the majority of brake applications made at average speeds was two inches. In emergency applications or even very heavy service applications made at high speed and held to or near the stop the difference would be quite a little more.

With the modern passenger equipment cars the difference between standing and running piston travel averages about two inches. Hence, if piston travel is adjusted by hand and at eight inches it means that the travel will be about ten inches running, thereby reducing the brake efficiency below what it should be.

Lost piston travel, including that of running over standing, is mainly due to lost motion of axle brasses in boxes, boxes in pedestals, between the truck and its bolster, at the truck center bearing and to deflection of brake rigging under load, including the brake beams. While one method of determining it has already been indicated, a more accurate one is to use a steam engine indicator, connected to the brake cylinder. Diagrams and a description of such a test and of the results are comprehended in the 1896 or "Boston" proceedings of the Air Brake Association.

444. High Pressure Affecting Wheel Sliding.—"Is there a greater liability of sliding wheels with the high-speed brake and 110 pounds brake pipe pressure than there used to be with the 70 pounds we used before we got the high-speed brake?"—*J. C.*

Answer.—While it is true that, with all else the same, raising the brake pipe pressure increases the liability or, at least, the possibility of sliding wheels, yet observations of results with many high-speed-braked trains is that wheel sliding is, if any different, decreased. Whether the results will be the same where all passenger trains use the old high-speed brake, with 110 pounds brake pipe pressure, depends almost entirely on (1) what is done to put the brakes in proper condition and so maintain them and (2) how the engineers do the braking.

Regarding the first of these, if all brake rigging is made amply strong, leverage is properly proportioned to weight, *running* piston travel is kept uniform, suitable brake shoes of one kind are used, brake cylinder leakage is prevented and all brakes are kept cut in we will have each car and, as near as it is practicable, the locomotive holding itself when brakes are applied, instead of one helping to stop the other, as when these conditions do not exist. Where brake applications cause the slack to run in or out heavily, but which does not mean with a severe or damaging jolt or jerk, the sudden change in speed, even though slight, this will cause is very liable to break the grip of some wheels on the rails and cause them to slide. Increased slack between cars is, therefore, another factor contributing to wheel sliding.

Just how much braking force, as this term is ordinarily employed, can be used without wheel sliding where every part of the train produces the same rate of deceleration or reduction in speed, is something yet to be determined.

Regarding the work of the engineer, if his method of braking results frequently in a high brake cylinder pressure at low speeds there will be more wheel sliding than if he improves with the times and the brakes and does the braking so as to have a low brake cylinder pressure at such times, as by employing the two-application method.

In view of such improvements in equipment, maintenance and operation having generally followed with the use of the high-speed brake, employing 110 pounds brake pipe pressure, it is believed that there is generally less liability of wheel sliding with it than with the less satisfactory conditions that formerly prevailed with 70 pounds brake pipe pressure.

445. Quick Action from Erratic Feed Valve.—"In reading the January Magazine I note the statement, in answer to question 418, that a feed valve that varies four to six pounds in its regulation may cause the brakes to apply quick action while the handle of the automatic brake valve is in running position or immediately on it being moved to service position. As I do not fully understand how this can occur if triple valves are in good working order, will you kindly explain?"—*W. R. Z.*

Answer.—It will not occur with triple valves in good order, but many are not so, which is not surprising as the average time the freight valve goes without cleaning is close to a year, and many go longer. Then, too, some of those doing this work are not as well informed on it as is desirable, while others lack the facilities for proper testing. The same applies to some repairs made.

The valve that will operate improperly, as indicated in the question, thus causing all of the others to apply quick action, is one with which the piston and slide valve move too hard after the piston has moved far enough toward application position to take up the lost motion between the collar or spider on the end of its stem and the slide valve, then has been stopped by the slide valve resistance. The next movement of the piston toward application must again overcome the resistance of the piston and, in addition, that of the slide valve. Where such is sufficient to permit the brake pipe pressure to leak down five or six pounds below that in the auxiliary reservoir before the piston starts, its motion will be so rapid as to carry the slide valve to emergency position, thus throwing he entire train into quick action.

It does not follow that this result would have obtained in a service reduction if the feed valve were in good order. The reason is that this triple valve main piston would then have been in release at the time the reduction commenced. The reduction by the brake valve would cause the brake pipe pressure to fall more rapidly than would the brake pipe leakage alone. As the piston is easier to move than the slide valve it would start quickly and the collar on its stem would hit the end of the slide valve a blow, as with a small hammer. This would *start* the slide valve with less difference between the brake pipe and auxiliary reservoir pressure than in the previous instance, it would be moved on to service position and the graduating spring would be able, even if the piston touched its stem, to prevent farther movement.

From this it will be seen that too slow a reduction of brake pipe pressure may cause a bad order triple valve to cause undesired quick action, where a more rapid reduction would prevent it. It will be apparent that an overcharged brake pipe and the brake valve handle returned to running position can also cause undesired quick action, even with a good working feed valve, as the latter could not supply brake pipe leakage until the overcharge had leaked away.

Undesired quick action from either of the conditions here considered is not frequent, but even a rare case, omitting such other detriments as brakes creeping on and sticking, is sufficient to warrant keeping feed valves in good order and in so handling the brake valve as to avoid a material overcharge of the brake pipe.

446. Running Positions Not Release ET Brake—"What is the cause when the locomotive brake will not release when the handle of the independent brake valve is moved to running position, the automatic brake valve being in running position? To release it was necessary to move the handle of the automatic brake valve to release position, then back to running position. The locomotive has ET equipment."—*C. A. L.*

Answer.—This was, evidently, the No. 6 ET equipment, as the action referred to will not occur with the No. 5. The reason for the failure to release when the handle of the independent brake valve was moved to running position is that the equalizing piston of the distributing valve had moved its slide valve to lap position. The short use of release position of the automatic brake valve moved this piston and its slide valve to release position, which permitted the brakes to release as soon as the handle of the automatic brake valve was returned to running position.

To cause the locomotive brakes to release with either ET equipment it is necessary to discharge the air from the application cylinder. Considering locomotives with the automatic brake valve cut in, not helpers, with the No. 5 ET this is assured by placing the handle of each brake valve in running position, there being no other means provided by which the passage to the atmosphere can then be closed. The No. 6 ET is different in that the equalizing valve of the distributing valve controls this passage, as well as the two brake valves, and must be in release position to open it.

In the instance described the equalizing valve had, doubtless, been moved out of release position by the pressure chamber having been overcharged—above the regulation of the feed valve—by a previous use of release position of the automatic brake valve and the following reduction of brake pipe pressure, by leakage, after the handle of the automatic brake valve had been returned to running position. A quick "kick-off" movement of the handle of the automatic brake valve will always start the release in such a case. Also, as is well known, release can be accomplished invariably under any conditions by using release position of the independent brake valve.

The object of this arrangement of the No. 6 ET is to, in case of a burst hose, break-in-two or use of a conductor's valve or tail-hose, insure that the locomotive brakes will apply and stay on with the train brakes without the handle of the automatic brake valve being moved out of running position. However, there are those who are equally satisfied with the No. 5 ET operation under such conditions, first, because in cases mentioned except, perhaps, the use of the tail hose, the engineer by habit and instructions moves the handle of the automatic brake valve to lap as soon as he realizes that the brake pipe pressure is being reduced. He learns of this quicker with the No. 5 ET because the exhaust is heard at the brake valve before the brake application is felt.

Second, they consider that such loss in locomotive braking power as occurs before the brake valve handle is moved to lap is advantageous in reducing the liability of drivers being slid.

Third, they prefer that the driver brake shall not be applied heavily by trainmen unless the engineer so elects, as if he moves either brake valve handle to lap. There are good arguments on both sides.

447. E-6 Safety Valve.—"Explain the operation of the E-6 safety valve and advise at what pressure it should be adjusted with the ET equipment."—*J. C.*

Answer.—This safety valve is of the "pop" type. That is, it is so designed that when it commences to open, the valve lifts quickly, and when it has reduced the pressure to a very little less than required to open it the valve closes promptly. The object sought is a close regulation between open and closing pressures and a capacity sufficient for its use.

The valve proper is of the piston type and has, outside of its seat bearing, a lip or flange against which the escaping air acts to produce the quick opening action. There is a small passage or by-pass that leads from the bottom of the piston valve around the latter to the small chamber above it. This passage is open when the piston valve is near or on its seat, but the upper end of the passage is closed by the top of the piston valve passing beyond it when this valve is well open. There are two small openings from this chamber above the piston valve to the atmosphere. The direct discharge openings are near the seat of the piston valve, and the lower end of the latter, when the valve is seated, passes below these openings, which also assists in obtaining the prompt opening and closing desired. The piston valve is acted on by the regulating spring above it, and this spring can be adjusted by the regulating nut.

When the piston valve is well open the only air that reaches the chamber above it is the little that leaks past the piston valve, as it then has the by-pass closed, but as this valve nears its seat, as the pressure reduces, the by-pass is opened and allows some of the escaping air to reach the chamber above the piston valve and, owing to the restricted discharge from this chamber, aid the regulating spring to force the valve shut, which is aided farther by the piston valve closing the direct discharge openings and, thereby, forcing more pressure into the upper chamber mentioned.

The size of the vents from the chamber above the piston valve varies, being made to suit the fit of the piston valve. Hence no change should be made in the piston valve or the vents except by a repairman understanding the device and having facilities to test each valve and adjust the upper vent openings to suit the conditions found.

This valve is designed for the No. 6 ET equipment and should be regulated to open at 68 pounds.

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Railway Club Proceedings

The Relation of the Brick Arch to the Efficiency of the Present Day Locomotive Boiler.[*]

For a number of years, as many of those present here this afternoon know, it has been necessary for me to have a personal and intimate knowledge of the successes and failures, the good points as well as the bad points of the locomotive boiler. I believe that you will all agree with me that there is no part of the locomotive today which requires more careful and painstaking care than the locomotive boiler, as a higher degree of efficiency of the steam generating plant of the locomotive is required to keep pace with the rapid increase in the size of the steam engine. In former years it was not necessary to pay much attention to the locomotive boiler, because if the cylinders were large enough to pull a large train up the maximum grade and the wheels were loaded to enable the cylinders to do their work, the result was satisfactory; but rapidly the size of the cars was increased, higher speeds were demanded, and train service, as regards speed and tonnage, commenced to be limited by the size of the boiler.

This development is within the knowledge of all of us here present, and from that day the relative importance of the locomotive boiler to railroad operation began to increase and has continued to increase by leaps and bounds until, at the present day, the problem of the locomotive boiler is one of the largest and most important confronting motive power officials. Consequently, the result is that the future development of the steam locomotive is directly dependent upon the further development of the efficiency of the locomotive boiler. To put it stronger, the ability and the capacity of the American railroad to handle traffic is limited today by the locomotive boiler. In fact, the locomotive boiler is becoming the petted child of the locomotive designer, and sacrifices are being made in the weight and strength of other parts in order that the size of the boiler may be increased, and the boiler today is being made as large as possible in order to obtain all the steam possible for the engine. A free steaming locomotive is becoming every day more valuable to the railroad. We realize more and more the necessity of making our locomotive boilers more efficient, as we cannot hope to obtain a much greater capacity, the locomotive boiler having now reached its limit in size on account of the physical conditions of the railroad. Consequently, we are face to face with the proposition of getting the maximum amount of work from the locomotive boiler; and the object of my paper this afternoon is to present to you what I believe is one of the practical and feasible methods at hand for so doing. Therefore I will discuss for a few minutes the relation of the brick arch to the efficiency of the present day locomotive boiler.

A review of the history of the bituminous coal burning locomotive brings forth most prominently the importance that the brick arch played in the earliest attempts to burn bituminous coal. When the problem of changing from wood to coal necessitated the successful burning of bituminous coal, the motive power officials at that time used the brick arch as one of the efficient appliances to bring about that result, and a careful review of the opinions of motive power men of that period shows the high regard in which the brick arch was held; it clearly demonstrates its recognized value in locomotive operation at that time.

As the burning of bituminous coal became an easier problem with the increased knowledge gained from experience, the brick arch commenced to receive less attention. As the efficiency of the locomotive boiler was not a relatively important factor, the importance of the arch commenced to decline. It was attacked in the house of its friends, as it became easier to obtain larger boiler capacity by the simple means of increasing the size of the boiler without necessitating particular attention to its efficiency. This condition continued until recent years, when we have come face to face with the proposition that the larger boiler capacity cannot be obtained by this simple means, and we must work in other directions to obtain increased efficiency, for which motive power officials are being called upon today as strongly as in former years.

The value of the brick arch in this latter period of the history of the modern locomotive boiler as a means of further increasing its capacity is already being recognized by many of the best railway systems in the country. At the present time, if we may judge from the discussions of this subject by leading mechanical experts and organizations interested, we must conclude that the brick arch has again come into its own and must be reckoned with as an important aid in operating efficiently the modern locomotive.

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[*]Paper by George Wagstaff.

In studying this subject from all its various standpoints, weighing the advantages and disadvantages and the opinions, pro and con, of those who have used brick arches, I cannot help expressing strongly my belief that, in view of the recent great improvement in boiler care and maintenance, in addition to the successful treatment of water and the successful improvements in hot water boiler-washing plant, etc., that the disadvantages claimed for the brick arch have almost been practically overcome.

From the earliest history of the arch there does not seem to have been any question about its advantages and its value in locomotive operation. Therefore, with the wiping out of the disadvantages, the nonuse of the brick arch means the practical throwing away of a large amount of valuable power. The arch is recognized as the most efficient device for reducing the quantity of sparks thrown from the stack, and on this account it becomes directly valuable as a fuel saver. It increases the length of the flame weight, and the finer fuel, when lifted from the grate, is baffled by the arch. It is consumed, instead of passing directly to the tubes and out of the stack in the form of sparks. It causes more equal distribution of the draft over the grate, and thus improves the furnace action. Its function in the firebox being that of a mixer and baffle, brings about a more complete mingling of the gases, and thereby aids combustion, resulting in the higher temperature and the production of a smaller proportion of carbonic oxide. These claims have been fully sustained by the measurements made in the locomotive tests conducted by the Pennsylvania Railroad at St. Louis in 1904.

The two consolidation locomotives there tested were almost identical in grate area and heating surface, but one of them was equipped with the brick arch and the other was not. The draft riggings in the smoke boxes were not alike; one being arranged to clear the box of cinders, while the other allowed them to remain in the front end. However, the effect of the brick arch on sparks and cinders is shown in the total amount drawn through the tubes, which is given as an average (for the four tests at 160 revolutions) of 380 pounds for the boiler with the brick arch and 505 pounds for the one without.

The temperature of the firebox as an average of these four tests was 2,202 degrees F. for the brick arch and 1,982 degrees F. for the tests without it. The maximum temperature was 2,312 degrees F. with the brick arch and 2,112 degrees F. without it. The firebox with lowest temperature had the highest amount of CO due to imperfect combustion. The maximum percentage of loss of heat in coal fired due to imperfect combustion of CO was only 2.09 for the brick arch and 16.33 per cent. for the firebox without it.

The above advantages of better combustion and consequent fuel economy are only a part of the advantages to be obtained from the use of the brick arch, and in my mind, in view of the problem of the present day operation, they are the smallest. We know that the first requirements made of the motive power department by the operating department are to furnish efficient power in order to move the traffic; next, to move it expeditiously, and last, as economically as possible.

We know that the economy frequently is, and must be, lost sight of when large movements of traffic confront our railroads, and it is in this situation that I believe the brick arch assumes its largest value to the railroad.

We have frequently seen instances where a poor steaming engine or engines have seriously impeded the movement of traffic, resulting in congested terminals, delayed passenger trains and a large amount of overtime for the employes in all classes of service. These are losses that can hardly be measured in dollars and cents, as the ability of a road to pay dividends is directly dependent upon its ability to handle its traffic with the minimum amount of delay.

It may seem to some that I place an exaggerated importance upon the brick arch in its relation to the modern locomotive boiler, but I cannot see, in view of the present demands made upon the motive power department, how any device that increases the efficiency of the locomotive boiler from 5 to 10 per cent. can be allowed to pass with any less consideration.

THE PRESIDENT—Gentlemen, the paper is now before you for discussion. I believe this is a subject on which all locomotive men do not agree, as to the necessity of the arch; consequently it ought to provoke good discussion. We would like to hear from Mr. Hogan, if he is in the room, on this subject, to open the discussion.

MR. HOGAN—Mr. President and gentlemen: I was in hopes you might call upon some one else to open this discussion. Mr. Wagstaff has prepared a paper on a subject that is most important in the proper maintenance of locomotives today. Knowing his experience in the proper care of locomotive boilers, I am sorry that he did not have time to deal with the subject at greater length, explaining to us just how the arch should be applied, particularly in its relation to the crown sheet, flue sheet, which play an important part in equipping our locomotives with brick arches. We know that many roads have rules governing the application of brick arches, and we might say that while, until recently, a standard size brick has been furnished by the brickmakers, some roads have adopted smaller sizes which are more convenient to handle. They advocate running four rows of brick, others five rows, some six. Engineers will tell you, "Well, the engine I am running isn't steaming as well with four rows of brick as she does with five." Now I am satisfied that Mr. Wagstaff can explain to us just the proper location and how they should be supported. Many roads are supporting them with lugs in the side sheet, others with arch tubes or water bars.

In the first paragraph on the third page of his paper Mr. Wagstaff very truthfully says: "The arch is recognized as the most efficient device for reducing the quantity of sparks thrown from the stack, and on this account it becomes directly valuable as a fuel saver." Now, any man who has ever run a locomotive and given it the proper attention knows that the brick arch is a fuel saver, and knows that if the locomotive is properly drafted and the firebox is in good condition it makes a better steaming engine. I know from experience and many here in this room also know it. Therefore, advice from a man of Mr. Wagstaff's experience as to how to properly maintain and apply the arch would be very valuable to the members.

The figures that he gives in his paper in connection with a test at St. Louis seem to me very flattering for the brick arch. In fact, I believe that more flattering results have been obtained on railroads where the arch is in use. Years ago many roads adopted the brick arch, and, after what they thought was a fair test, abandoned its use. After awhile they returned to it and found that they were getting much better service with the use of the arch than without it. I know from my experience in running locomotives with and without the brick arch and having charge of locomotives under the same conditions that there is no question but that great economy is assured in the use of the brick arch if properly applied and maintained. But we must, as Mr. Wagstaff states in his paper, give proper attention to the care of the boiler, to the feed water, and in doing that, as I said before, we unquestionably derive great economy from the use of the brick arch. (Applause.)

MR. TALTY—Mr. President: While the road with which I am connected does not use the brick arch, I was at one time employed with a road that did, on what is known as the old footboard engines. I fired one at the time. From my experience I think that the brick arch, properly applied and maintained, is a fuel saver, but if it is not maintained it is pretty extravagant on coal. That is, in other words, if the brick arch is not properly taken care of, and the flues kept cleaned, and the brick arch kept clean, the fireman will usually go to the coal pile for steam every time. I never fired a locomotive that acted quite as bad as the one with the brick arch if the engine did not steam; it was a mighty good thing to burn up gloves and overalls. Most of the heat seemed to come out the firebox door. Of course we all realize that anything that will maintain higher boiler efficiency in the way of preventing leaks or enable it to generate steam more freely, is valuable in getting freight over the road, especially where there is lively competition. But I think what should be looked at is the net. If applying a brick arch to locomotives will not save fuel and prolong the life of the boiler to offset expense of maintaining same, I cannot see where the company is benefited by it.

I do think that where fine coal is used on locomotives that there is a saving. As Mr. Wagstaff says in his paper, the coal is held in the firebox long enough to give off some heat before being drawn through the flues. It has been my experience on a locomotive that does not throw sparks, that we are unable to run as far between the cleaning of the fires as we are if they shoot up a few live ones. In those brick arch engines that I fired, the first layer of brick did not go tight against the flue sheet or the throat sheet; there was a space of about six inches; and at that time, the way they were applied, I could not see much difference in the amount of sparks discharged from a brick arch engine than from one that did not have the brick applied. I should imagine that it is quite an undertaking to maintain the brick in a locomotive. I really think that in the bad water districts, with high pressure locomotives, there is a condition that will decrease the life of the firebox whether it is a brick arch engine or one without a brick.

On our road, as I have stated, we do not have any brick arches. It has been my experience that, to prolong the life of a boiler, the first thing to be taken into consideration is the proper drafting of locomotives to burn the fuel that is consigned to that division or road, and if the engines are properly drafted and maintained, it is a question in my mind whether the brick arch will save enough coal to increase the net earnings of the company that applies and maintains brick arch engines. I believe that roads having the brick arches applied draw the fire every time the engine comes to the terminal, and there is a set of men that do nothing but keep those brick arches in proper condition. I really think that unless such a system is established we could have poor steaming engines with brick, more so than where brick is not applied. I would like to hear from Mr. Hurley, Mr. President; he has had experience with brick arch engines.

MR. HURLEY—Mr. President and gentlemen: Having had some experience with the arch I can say that, properly maintained, it is both a fuel and flue saver. It will protect the flues from being plugged and from cold air entering the firebox. We have some trouble in maintaining the arch; that is, the brick; it is somewhat brittle at times and it will come down; but when the brick does come down we find no great trouble in keeping up our steam pressure. On the other hand, where the brick is maintained, I would say that in 150 miles of a division we will save with the arch anywhere from a ton to a ton and a half of coal. There are different grades of arches and different grades of brick. I am satisfied that Mr. Wagstaff can enlighten us on the quality of brick and the proper method of applying them. I would like to hear from him on that subject, Mr. President.

MR. CHAMBERLIN—I think it is but fair, Mr. President, that Mr. Wagstaff should have an opportunity of answering all of the questions propounded in rebuttal, or in a "bunch," if you prefer. If you insist that he answer questions of each member at the time asked, without giving him time to digest them, you will be very apt to worry the witness, and while I have never yet seen Mr. Wagstaff confused under the most rapid fire of questions, I believe that you will concur in the opinion that he is entitled to a "show for his white alley."

THE PRESIDENT—We will give Mr. Wagstaff an opportunity to reply to these gentlemen before he gets through. There are several other gentlemen who know a whole lot about this subject. If they don't get on their feet pretty soon I am going to call on them. We would be very glad to hear from Mr. MacBain.

MR. MACBAIN—Mr. President and gentlemen: Not being a member of the club I had not intended to make any remarks, but since you have kindly given me the opportunity I feel that as an advocate of the brick arch it would be proper for me to let you have my views on the matter. I have been connected with the locomotive service all my life, have had experience with brick arches more or less for the past twenty-five years, as an engineer, a road foreman, master mechanic and assistant superintendent of motive power. As Mr. Wagstaff says in his paper, a great many difficulties were in the way of the proper use of the brick arch in the years that have passed, difficulties that at that time seemed insurmountable, but owing to improved methods, as alluded to in the paper, together with a little better organization in engine houses to take care of the proper cleaning of grates, adjusting of arches and cleaning out flues, and in so far as we are concerned we do not find any difficulty, or at least not 5 per cent. of the difficulty at the present time that we used to have in maintaining arches in our locomotives. I wish to say, too, that after you have drafted your locomotive as fine as skill can possibly do it, without a brick arch, that by a slight readjustment and the application of a properly proportioned brick arch into that engine, you can increase its efficiency, especially in high speed passenger service, not less than 10 per cent. and at the same time effect an economy of anywhere from 5 to 15 per cent.

THE PRESIDENT—Is Mr. Tuma in the room?

MR. TUMA—Mr. President: I haven't had very much experience with the brick arch locomotive; it has been very limited on the brick arch; but from my experience I have not found any advantage in the brick arch locomotive, particularly in bad water districts where we experience trouble from flues leaking. We know that there is an advantage in the use of the brick arch, especially in good water districts; when not troubled with leaky flues. I am not in favor of any brick arch on any locomotive where bad water is used in the locomotive boilers. I think the greatest economy in fuel begins right in the front end of a locomotive, in proper drafting and getting the proper distribution of draft through all the tubes. That is the main point to start with, regardless of whether you have brick arch or nonbrick arch engines. One of the things that we have to contend with, to eliminate, is the throwing of sparks, to prevent fire, and at the same time obtain the greatest efficiency that can be obtained from a locomotive.

With locomotives that are not steaming freely, by changing the draft and getting more equal draft and equal heat through all the tubes, we can increase their efficiency and decrease the fuel consumption. In regard to bricks, I cannot say anything further.

MR. CHAMBERLIN—Mr. President: If you will pardon me—I am not going to talk on brick arches—but to submit that in an organization of this character there should be no bosses to dominate, to make afraid, or prevent a free expression of personal opinion. Several gentlemen are here today bearing the titles of superintendents of motive power and master mechanics, et cetera; men who have won their titles honorably and through the cruel school of experience. In conferring with them they heartily concur in the opinion that we would get much valuable information if any or all of these reliable men, these engineers, who handle these great machines over our rails, would get upon their feet and talk. They are sure to say something of vital interest upon the subject. Mr. Aske, I believe, of the Lake Shore road, is here, and I think he can talk very intelligently upon this subject, and there are many more that could do the same if they will only make the effort.

Remember, my friends, that none of us pose as a "Demosthenes or Cicero" so far as speechmaking is concerned—but all of us know more about practical railroading in a month than these old back number orators knew in all their lives. So let us get together and impart and absorb in our own way, information that will not only be of value to us but to these great railroads we are endeavoring to serve to the best of our ability.

THE PRESIDENT—Mr. Aske?

MR. ASKE—Mr. President: I don't know why Mr. Chamberlin should be so flattering in his remarks about me. I am employed on a railroad where they use the brick arch in everything except a very few of the old style engines. The results in the engines in which we use the brick arch are nothing but the best. During the last year or so the expense of maintaining the brick arch has been reduced very much, so that a good large balance is left in favor of the brick arch after deducting cost of brick from benefits derived. We place our brick arch down next to the throat sheet. In the large passenger engines we put it six brick high. We have four water bars, and the brick is made in pieces to reach from one bar to the other, with the corner rounded out so as to rest snugly against the side as well as on the top of the bar. When flues become clogged it is a very small job to remove the center row of brick, the boilermaker or the fluecleaner being enabled to get in there with his flue-cleaning appliance and blow the flues out with very little trouble and replace the brick that were removed. We have engines running on heavy passenger service in which engine brick arches last thirty days. I know from experience that the engines develop a third better steaming efficiency with the brick arch than they did without it, and the use of fuel is in the same proportion. (Applause.)

MR. MEADOWS—Mr. President: I had not intended making any remarks on this paper. After listening to Mr. Wagstaff the thought came to me that he had hit the mark very closely and brought out some very good points. I agree with Mr. Hogan that the report would have been more complete if Mr. Wagstaff had dwelt a little on the placing of the arch, but I presume he will give us something on that line a little later. Now in my experience as an engineer, road foreman of engines and assistant master mechanic—I am firmly convinced that the use of the brick arch is very beneficial, that it will bring about at least 10 per cent. economy in coal consumption. On the road on which I am employed—the Canada division of the Michigan Central—we use the brick arch in all of our passenger locomotives; some of our freight locomotives are not so equipped. While we believe that we cannot get along without the arch, still our engines will steam without it. As Mr. Hurley states, in passing over a division of from 110 to 135 miles we are satisfied that we save from a ton to a ton and a half in coal consumed. Of course, in using a brick arch it is necessary that the arch be maintained properly to get the best results. It is the same with any other device. I do not care what device is put on a locomotive, you must maintain it if you are to get the best results. The same is true of drafting the front end. If done properly and the brick arch applied, you will get a benefit. We place our arches about six inches from the throat sheet and use four rows of bricks, or sixteen in all. I would be in favor of placing the brick close to the sheet were it not for the fact that occasionally the arch will become blocked. I would be pleased if Mr. Wagstaff would, when the opportunity is afforded, give us his opinion as to the location of the arch.

MR. HOGAN—Mr. President: Before Mr. Wagstaff gets up I want to differ with my neighbor, Mr. Tuma, with reference to the use of the brick arch in bad water districts. I am connected with a division where we have bad water—the worst division in this respect we have on a large railroad. We are obliged to wash boilers of our standard power once a week, and we run them that week without dumping out. Previous to the use of the brick arch we were not able to do that; our flues were not protected; owing to bad water we had to dump them nearly every trip, for the purpose of caulking the flues and on account of other troubles we had. Now I hold that the brick arch is beneficial, if properly maintained and applied, in bad water districts.

MR. TUMA—Mr. President: I want further to qualify my previous remarks as to what I claim for a locomotive without the brick arch. In the first place with the tubes on our Standard Locomotive with the diaphragm front end, we do not get equal heat through all the tubes.

My experience has been that the bottom tubes are the first ones that become deteriorated to such an extent that they have to be removed, due to the heating and baking of scales on the bottom tubes, which is an indication that we are not on the right line to get fuel economy. It is very evident that with the diaphragm front-end locomotive we do not get the same temperature through the top tubes that we do through the bottom tubes as already explained. There is more intense heat passing through the bottom tubes on a diaphragm front-end locomotive than there is through the top tubes. I think that these are the lines that we must work on if we are to effect fuel economy as well as proper boiler maintenance.

Locomotives with brick arches cannot be turned as quickly at terminals as the locomotives without arches.

The proper maintenance of locomotive fire boxes and tubes can be just as economical on the locomotive without the brick arch as with it, taking into consideration the cost of maintaining brick arches in locomotive fire boxes. Regardless of brick arches, if our locomotives are not properly drafted, we cannot get good results.

MR. TALTY—Mr. President: I would like to ask Mr. Meadows how much time intervenes from the time the fire is drawn, on a brick engine, before the boiler makers can get into the fire box and handle the brick—take out the center tiers to clean the flues?

MR. MEADOWS—In answer to Mr. Talty's question, Mr. President, I would say that the time varies. It is not necessary to remove all of the brick to get at the flues and if a short time or sufficient time for the brick to partially cool is allowed to elapse, but very little trouble is experienced in removing one or two bricks from the top of center row. To make this clear; our arches are put in, in three sections, and when necessary to give attention to the flues between boiler-washings, we only remove one or two of the brick in center. This allows the flue caulker to get close to flue sheet. The difficulty of getting at flues immediately after fire is dumped out is the greatest objection to the arch. If the flues are not in first class shape and need attention every second or third trip, we do have some trouble as mentioned. Boiler men do not like to get in the fire box and work over on along side of a brick arch on account of the heat in the arch. But we are satisfied that the gain more than compensates for the loss in that direction.

MR. TALTY—Mr. President: I would like to ask Mr. Aske if the brick arches that run thirty days have to be cleaned in the intervening time and how often the flues have to be cleaned? I would like also to have him specify whether they are dumped each trip after arrival at the terminal.

MR. ASKE—All our passenger engines are dumped clean each trip. Answering Mr. Talty's first question, it is very seldom that we find any dirt or any accumulation of cinders to amount to anything on top of the brick. If, for some reason or other, the engine should not steam very well, then we find cinders and dirt piled up on top of the brick. That is due to low steam, pressure not having sufficient draft to more than raise the cinders and dirt to the top of the brick, and not taking them through the flues. Our boilers are washed every six days. Every time the boiler is washed the center row of brick, or perhaps two rows, are removed and flues cleaned out; but the engines are dumped every trip at each terminal.

MR. TALTY—I would like. Mr. President, to inquire of Mr. Aske again if he has any data about the number of pounds haul to a pound of coal? He seems to have all the brick arches in passenger and freight service.

MR. ASKE—I did not understand your question.

MR. TALTY—I would like to ask what average mileage you are making per ton of coal, passenger and freight?

MR. ASKE—Well, that is a question. Mr. President, that I probably could not answer correctly and it is better for me not to answer it at all than to give you wrong information.

MR. TALTY—I didn't know but what you had some data, Mr. Aske.

MR. ASKE—No, I haven't any.

THE PRESIDENT—(Mr. Smith in the chair) We would like to hear from Mr. Nelson, if he is here?

MR. NELSON—Mr. President: I haven't had much experience with brick arches, not more than our Vice-President, Mr. Talty; my experience was about the same time as his. In later years it has been almost entirely on Wooten boilers, and I have never seen Wooten boilers with brick arches applied. I don't know but they do. But I am a good deal like Mr. Talty—we used to be rather tickled when the brick fell out; didn't we, Mr. Talty?

MR. TALTY—Yes, that was our experience.

MR. NELSON—I believe that a good deal of the fault then was due to the brick not being properly taken care of. That was a good many years ago. Perhaps there wasn't the right proportion or they were not rightly applied. But we used to have an awful time to keep the fire clean. That seemed to be the question; didn't it, Mr. Talty?

MR. TALTY—That was my experience.

MR. NELSON—The brick would seem to block up then and all you would get was what we used to call a "popcorn fire"; it would just become a solid mass of clinkers, keep growing right up; you couldn't do anything with it. I can't speak for the brick arch or against it because I haven't had the experience.

MR. HAWKINS—I had some experience with brick arches a number of years ago on the Rock Island Railroad, but it was with low pressure engines with comparatively small fire boxes.

It seems to me that the reason the brack arch has not been used with the modern type of locomotive as largely as with the older type, is on account of the enormous size of fire boxes, which, in a great many cases, are very shallow, having very little space between the grates and the bottom row of flues. This, together with having to support the arch upon tubes, which to my mind is a continual source of annoyance and expense, is a good reason for not using the brick arch in a modern locomotive.

I note one gentleman has just made the remark that he was glad when the brick arch fell out, and will say that I have known cases where the fireman would knock the arch down and get it out of the way.

I do not believe that locomotives having brick arches in fire boxes can be turned at terminals and dispatched as promptly as engines without them for the reason that if the flues happen to be leaking or are plugged up, it will certainly take longer to do the work, as it is necessary to wait for the arch to cool off.

The modern locomotive is quite a large piece of machinery and there is a good deal to look after and keep in repair. I would not be in favor of adding anything more that will give trouble on the road or be liable to hold the locomotive at the terminal for necessary repairs. While a trifle less coal may be consumed with the brick arch, I believe that the small saving would be more than offset by the expense of maintaining the arch and the time required to hold the engine for necessary repairs to the arch and on account of it.

I do not believe when these questions come up that everyone should detail all of the good qualities without saying anything about the bad ones, and I believe to bring out all of the points some of us should get on the other side of the fence and look at the objectionable features, which I think will not be hard to find with a device of this kind.

I believe that some of the gentlemen who have spoken in favor of the arch, and have had considerable experience with arches in the modern locomotives, could give us considerable information as to trouble they have had with them.

MR. MACBAIN—Mr. President: I ask your permission and the permission of the meeting just for a few more remarks.

THE PRESIDENT—Very glad to hear from you, Mr. MacBain.

MR. MACBAIN—The matter just brought out by the gentleman who last spoke regarding the bursting of arch tubes and that kind of thing, is something that under present methods of setting arch tubes and the care that is being given, is of very rare occurrence. As to the care and turning of locomotives: after all, taking the net of which Mr. Talty speaks —when you get 3,500 to 3,800 miles from your consolidation engine for a month's work the year around, you are getting about all that is possible. I venture to say that four years ago, with the large power that was brought into use in a short space of time on the New York Central Railroad, any of the men who have had experience in maintaining that power would have held up their hands in horror at the idea of having to maintain arches in those locomotives. But that time has passed. We are not only maintaining our arches in our passenger engines, but we are maintaining them in our freight engines, and we are getting as good mileage out of our freight power as was ever obtained under any other system used on the New York Central or any other road. The difficulties of taking care of flues and grates, with an arch in, is very largely exaggerated; that is, the difficulties. When a locomotive comes in on the clinker pit, as Mr. Hogan has stated, if the flues are tight the fire is cleaned on the engine, shaken down, banked up and the engine is put into the house, ready for service. We find that all that is necessary on our locomotives is to give the flues and grates the proper attention in the matter of cleaning each time that the flues are worked over. We have to cool down our locomotives pretty well in order that the boilermakers may get into them, but we do not have to cool them off cold. We have a system at each of the roundhouses. An engine comes in and is needed for a quick turn; the steam is blown off, and a spray is put over the top of the arch which not only cools it off but also cleans it off absolutely. Then the boilermakers do their work. After they have finished the grate, men clean the grates and the flues are blown out with compressed air. A number of New York Central engine men are in the room and if there are any objections to what I say I would like to have them get up and say so. Our engine men, especially in the passenger service, would almost rather lay off than go out on the road without having the arch in the engine. That is our experience, Mr. President. (Applause.)

THE PRESIDENT—We have Mr. Angus Sinclair with us this afternoon and we would be very glad to hear from him. (Applause.)

MR. SINCLAIR—Mr. President and gentlemen of the Central Railway Club: I am one who is in with the best of the brick arch and at one time had a great deal to do with it. Consequently I may be able to say something of value to the Club, something that will coincide with the views of some of the speakers and something that will be against others. It is very gratifying to find so much intelligent discussion of this subject, which has always been a difficult one, one that aroused great conflict of opinion among those operating locomotives. When I first began firing a locomotive the brick arch had just been introduced in Scotland; it was about the same time that it was introduced into New England by George S. Griggs, who is entitled to be considered the father of the brick arch. Under the system that I fired, engine men were allowed a premium for fuel saving; a certain amount of fuel per hundred miles and it was regulated according to the trains. The ton mileage had not come into use, but they struck an average of the amount of coal necessary to run certain trains and the premiums were established on that. Consequently it was a fair, practical way of establishing a premium. The men had very little to say against the justice of the premium, consequently you may infer that it was fair. Well, every engineer on the road was interested in saving coal and we would no more think of running without a brick arch than we would without a fire scoop. If the brick arch came down no one would think of taking the engine out again until the brick arch was renewed. In the first place, I suppose it was on the account of draft appliances being adjusted for the brick arch that it worked to perfection. An engine would always steam better with the brick arch than without it.

I think that where there have been difficulties with the brick arch, in any country, or on any railroad, it has been for want of proper adjustment between it and the other draft appliances. The brick arch is to be taken into consideration when an engine is being drafted. To draft it in a standard way without the brick arch, will not be satisfactory. The brick arch has been considered beneficial in two ways. That is, I am speaking of my own experience with brick arches. The public authorities were very strict with us regarding causing smoke; they were inclined to pull a fireman off the engine if he made much smoke with the engine, and the principal smoke-consuming device was the brick arch and methods of admitting air above the fire—a baffle plate or something of that kind, and my own experience was that you could prevent smoke much more readily when the brick arch was in use than without it. The philosophy of that is very well understood; you have a higher firebox temperature where the gases are mingling and consequently there will be better combustion than without the brick arch. As a reservoir of heat in a place where the gases pass over, it has very great value. So far as the difficulty of keeping it in condition is concerned, that has happened, to a great extent, from want of care. If you put a brick arch into a locomotive—as I have seen done in this country—and say, "There you are!" and do no more about it, do nothing about the draft appliance, but just say, "There's the brick arch!"—it is sure not to do well. The thing requires care and attention just the same as every other appliance about a locomotive. Someone said that those who abandoned the brick arch probably knew what they were about. I have seen a great many things abandoned by people who thought they knew what they were about and they didn't know what they were about. (Applause.)

THE PRESIDENT—Mr. Wagstaff?

MR. WAGSTAFF—Mr. President and members. It would suit me a great deal better if the gentlemen who have any questions to put would ask them while I am on my feet. Most of the questions have been answered in the discussion. It was in my mind while preparing this paper to try and set the motive power men thinking. The discussions have been mostly favorable to the brick arch; we have heard some things said against it. No equipment is put on a locomotive that you are not willing to take care of according to the value of the device. For instance, what good are cylinders if the packing is not maintained? What good are steam pipes if they leak? What good is a throttle if it is not kept in condition? What good are the many appliances there are on locomotives if they are not taken care of? The biggest trouble with the brick arch has been that it has not been properly constructed and maintained. If you will make inquiries of those who are spending their time designing brick arches you will find that the construction of an arch today is nothing like it was years ago. Why is it that so much pains is taken in building a stationary furnace? Compare the construction of one with the other. The furnace is constructed substantially to withstand the intense heat to which it is subjected and yet a number of large slabs of brick are placed loosely in the fire-box and expected to withstand the heat to which they are exposed. Unless arches are designed so that they will withstand what is asked of them you will never get a good arch. In reference to arch tubes being done away with because of their trouble. Mr. MacBain answered that question very well. Brick arches can be supported on studs in such a substantial manner that they will give good service. Some railroads don't use arch tubes but are equipping their locomotives with brick arches; while it is desirable to have arch tubes it ought not to be a drawback to the use of arches. If there are any questions other than have been mentioned that any of you gentlemen would like to ask I will be glad to answer them.

We must get away from the idea that formerly prevailed with reference to the brick arch and be up-to-date and progressive in regard to this very efficient appliance to a locomotive boiler. As long as the difficulties have been practically overcome as mentioned here this afternoon an application of arches as they are today would prove their efficiency. (Applause.)

VICE-PRESIDENT SMITH—I move that a vote of thanks be extended to Mr. Wagstaff for his very able paper and for his presence here to engage in the discussion, Mr. President.

(The motion was seconded in many places and unanimously carried.)—November, 1908, meeting Central Railway Club.

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The Wonders of Wireless

Few people realize the growth and present extent of the wireless telegraph system in this country. Considering the tremendous obstacles to be overcome, the distances to be covered and the thousand and one hindrances, the expansion of the idea from the time the first company was formed in 1900 to the present date is nothing short of marvelous.

The first patent connected with wireless telegraphy was taken out in 1872 by Mahlon Loomis. Nothing was done with it, however, and it was not until 1886 that the subject was again taken up in the way of a patent. From that time to the present, many inventors have been working on the project.

Today there are over fifty wireless stations on the coast lines of the United States which keep vessels at sea in constant communication with the land. The government maintains practically as many at its coast stations, including nine stations in Alaska. The government also has stations in Cuba and Porto Rico.

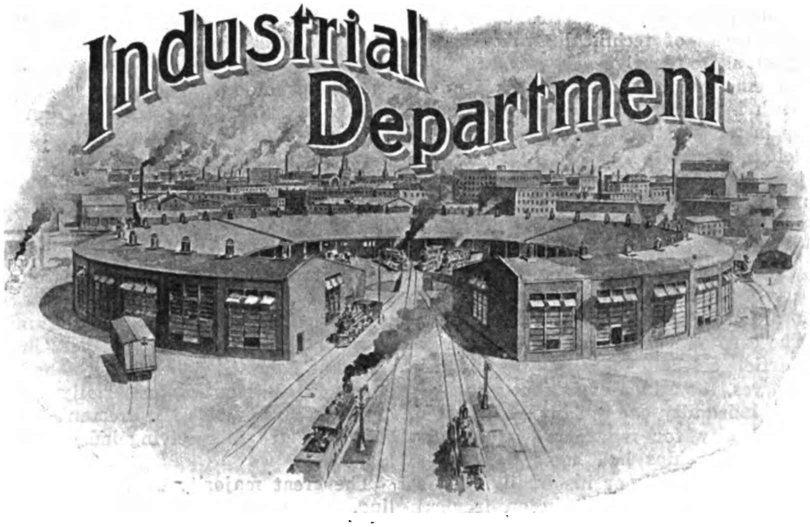
There are thirty-two steamship lines having vessels equipped with wireless apparatus, and a majority of the United States battleships are so equipped. The Marconi system has about fifteen steamship lines with vessels plying between this country and Europe.

Apparently the possibilities of the wireless are unlimited. Even in its present somewhat crude state the results are almost beyond comprehension. The longest message on record without relay was sent last July when the American fleet was on its way from Honolulu to New Zealand. Admiral Sperry's flagship exchanged wireless messages from Point Loma, Cal., a distance of 2,900 miles.

The longest message with one relay was from Savannah, Ga., to the armored cruiser Pennsylvania, en route to Honolulu, a distance of 4,000 miles, with a relay at Point Loma. The message traveled 2,070 miles over land and 1,930 over the sea.

It is said that a message can be flashed around the world in a minute and a half. But consider the expense of wires and cables.

Here a message is sent half way round the earth with only three stations equipped and using the currents of air in place of high-priced wires. Surely, man is working towards economy in nature.—Telegraph Age.



DISCUSSION OF CURRENT TOPICS

The Law's Delays.

Because of the efforts being at present put forth to establish an equitable system of compensation or indemnity for employes injured in the line of duty as such, and to provide for the dependent ones of those killed, by having the industry in which they are engaged bear the expense of such indemnity as one of its operating liabilities, the article entitled "Compensation For the Judicially Disinherited," appearing elsewhere in this issue, is of special interest. It deals with a deeply rooted evil of long standing and specifies a remedy in the form of Hon. A. J. Sabath's compensation bill, which remedy, if put into operation, will constitute an effective step towards the universal elimination of this great evil from our social system.

One feature of this measure which if practicable is specially commendable, is that which proposes to put the system of compensation it seeks to provide upon "such a basis that the Supreme Court of the United States cannot in the last instance find an excuse for declaring the act unconstitutional." Bitter experience has demonstrated the extreme difficulty, if not impossibility, of formulating measures for the emancipation of workingmen from the awful oppression of judge-made laws or for their amelioration otherwise that that august body will permit to stand. The barbarous injustice of compelling the employe (or his family) injured or killed in the line of his duty as such, to bear the entire burden of suffering and loss incident to such injury or death is being more and more recognized by fair-minded men in all walks of life. Judging from action already taken in other countries it would seem as though society in the United States has reached a stage in the development of civilization when the relationship between employer and employe which is expressed in the term "master and servant," must inevitably give way to one of equal justice and fair dealing between them as man and man.

The captain of industry who has fattened on the existing inhuman conditions meets the proposition for the payment of equitable indemnity to the injured employe, or if killed, to those dependent on him, with the pompous declaration that the courts of justice are open to them just as they are to other citizens. In this assertion there might be some merit if our courts were all really "courts of justice" or free from the control either direct or indirect of wealthy employing interests, and, in addition thereto, if our system of jurisprudence was such that the administration of justice could not by a process of technical trifling be so delayed as to deprive for years the injured employe, or, if killed, his family, of such indemnity as they eventually receive in those extremely rare instances in which they win their cases. One of the objects of these delays is to tire out the wage-earner or his heirs, to exhaust their —at best—but too limited financial resources and discourage them with a view to their eventually compromising for a merely nominal sum or abandoning the suit altogether.

The case of Thomas M. Kane, cited in the article referred to, is but one in hundreds, yes, thousands of instances wherein the indemnity came many years after the necessity for relief and its accompanying hardships had made themselves felt to the employe or his family. It is suggested by the author, in an ironical mood no doubt, that in this case the widow of the deceased fireman was able to get along during the ten years of protracted litigation on the accumulated savings of her dead husband. That such was the case is exceedingly unlikely, for, as a rule, firemen having others dependent on them can save but little from their wages. The greater probability is that she supported her household by her own labor or the assistance of relatives, and we regret to say that experience in such matters impels us to the conclusion that the verdict was rendered in her favor because a sufficiently plausible subterfuge could not be found under which to give a final decision against her. One judge—an ingenious worthy—thought he could accomplish the noble purpose of depriving this widow of just damages and save to the railroad company the amount thereof through the ponderous contention that while it was proven that the engineer was in control of his fireman and maintained a relationship of superiority towards him, through the operation of which the fireman had exposed himself to the danger resulting in his death; because the said engineer was not also commander-in-chief of the entire train crew and not therefore the superior of the man who caused this fireman to be killed, the family of the deceased fireman was not entitled to damages. Oh, what weighty, convincing argument; what profound erudition!

This most learned jurist also found Fireman Kane guilty of contributory negligence because forsooth he stood in front of the boiler to clean the number plate. As a number plate is a fixture on the engine, and as no one could possibly clean it without standing in front of the boiler, and as it was at that time the duty of Fireman Kane to clean that number plate, and as he was doing it under the directions of a superior, it would be certainly interesting to know on what process of reasoning and by what course of argument the conclusion was based that this fireman was guilty of contributory negligence. While this grossly unjust and ridiculously illogical and foundationless decision was reversed by the Circuit Court of Appeals, it nevertheless had the effect of contributing materially to the awful delay to which the fireman's family was subjected in receiving indemnity for his death.

The great majority of judges are willing, and, we are sorry to say, eager to take advantage of any miserable technicality upon which they can feel justified in rendering a decision against the employe, and many of them like this individual will even entirely abandon the realms of reason and logic in order apparently to trump up an excuse for deciding in favor of the corporation and against the working man, regardless of how cruel may be the injustice which such proceeding inflicts. While at best there would be in our courts very little chance of success for the wage-earner when engaged in litigation with a wealthy antagonist, the present condition of affairs will never be improved until Federal judges are appointed absolutely on their merits rather than through the influence of corporations and crooked politicians, and state judges receive their power direct from the people rather than through the medium of corrupt and depraved political bosses. However, even though our system of jurisprudence were such as to insure absolute justice in litigation between employer and employe, or between rich and poor, it would be vastly better that an equitable fixed weekly or semi-monthly rate of compensation be provided to indemnify injured employes (or, if killed, their families) for the loss of their earning powers, than that they should be compelled to sustain lawsuits in order to secure such indemnity.

By many prominent men, amongst them President Roosevelt, the necessity for establishing such a system is recognized, these men being no doubt fully convinced of the hopelessness of a working man's chance to secure damages through the courts at all, or, if at all, of the almost interminable delay to which he is subjected in getting such relief. While they may not openly proclaim it, still the inference is justifiable that they are impelled toward such a conclusion by a realization of the extent to which the courts are under the influence of our modern plutocracy.

Thrown on the world, in many cases with a dependent family, unprotected, when most in need, the oppressive and inhuman exploitation of the white man involving these conditions no less demands redress and remedy than did the chattel slavery of the negro.

Mr. Sabath's compensation bill is based on the theory that the injured employes of all mail and interstate carriers shall promptly be paid an annuity based on the rate of their pay when they were injured, and if killed that their dependents, whether wife or children or parents, are to receive an annuity based upon what the persons killed were earning at the time of their death.

As above stated, Mr. Sabath's bill proposes to put this system of compensation upon such a basis that the Supreme Court of the United States cannot find an excuse for declaring the act unconstitutional, for which reason the bill "proceeds upon the theory that the government of the United States may impose whatever conditions it chooses in its contracts with the carriers who may contract to haul the mail. This not being subject to the limitations of the constitution in respect to regulations of interstate commerce, and which theory if it holds good is just as important to the life of the bill if it becomes a law as is its enactment by Congress. Without a provision of this kind it would be mere mockery to pass such a law, as experience has demonstrated that the Supreme Court, if given an opportunity to pass on it, would lose no time in declaring it unconstitutional. While this bill, being a Federal measure, will apply only to interstate railroad and government employes, its operation will so materially influence the universal establishment of the system it proposes of compensating employes injured in the performance of their duties as such, or those dependent on them if they are killed in the performance of such duties, that it can well be regarded as one of the most important measures affecting industrial conditions ever introduced in Congress.

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TWO GREAT LABOR UNIONS IN LIFE AND DEATH STRUGGLE

Plutocracy Seeks to Crush Them—Buy No Shoes or Hats Unless They Bear the Union Label.

There is only one power that can eradicate from our social system the evils of child labor and the sweat-shop, and secure equitable wages and fair conditions of employment for wage-earners generally—that power is Organized Labor. Every influence that can be brought to bear to obstruct the work of organized labor in the accomplishment of this great purpose is being utilized by the interests to which the sweat-shop, child labor, long hours and low wages mean profit. If these interests could only crush the power of organized labor they would have a free and open field in which to sacrifice their fellow men on the altar of greed.

For some time past a concerted plan of action has been on foot to disrupt labor organizations. The Manufacturers' Association and other kindred organizations are bending their united efforts towards the accomplishment of that end. As a result of that movement two of the greatest and most active labor organizations in the trades union movement are at present engaged in a life and death struggle with this capitalistic combination. Recently the Associated Hat Manufacturers have declared that the hatters' union label must go, that in the factories which they control they will no longer tolerate or permit its use. With the union label once gone and the power of organized labor in these factories broken, God himself only knows the extent of the miseries to which the employes of such factories will be subjected, the extent to which child labor and woman labor will be used to substitute man labor or the cruelties from which the little slaves will suffer. In order to avert this dreadful condition of affairs, over twenty thousand members of the United Hatters of North America are at present on strike.

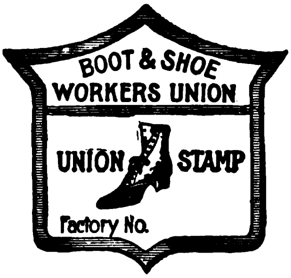
Boot and Shoe Workers.

The Boot and Shoe Workers' Union in endeavoring to maintain its principles has clashed with the great W. L. Douglas Shoe Company. That concern has so antagonized the interests of the Shoe Workers' Union that that organization felt justified in withdrawing from the company the use of its union label. One of the grievances with which the union has to contend is the fact that since November 1st, when its contract expired, the company has moved about 70 per cent. of its business to nonunion towns and is now paying a rate of wages ranging from 25 to 40 per cent. less than it had been paying at its headquarters city, Brockton, Mass.

The Boot and Shoe Workers' Union endeavored to organize the help in the factories of those nonunion towns and met with the greatest opposition on the part of the firm's officials. The tactics of the Douglas Shoe Company according to the officers of the union have brought about a very material reduction of wages of its members.

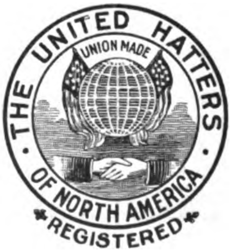
It Is for Organized Labor to Say Who Shall Win.

It is entirely for organized labor to say which side shall win in this fight. If its members will simply refuse to buy any hats or shoes except such as bear the union label, the United Hatters of North America and the Boot and Shoe Workers' Union, will be victorious, but if in addition to buying shoes and hats only that bear the union label all members of organized labor will exert their influence with their friends to do likewise the victory for the union hat and shoe workers will be all the more decisive and complete. Our Brotherhood constitutes a great army of nearly 68,000 men. Think what our active support will mean to these two labor organizations struggling for their very existence against the power of plutocracy. Let us then, brothers, not only exercise special care in seeing that every hat and every pair of shoes we buy bears the union label, but let us also exert our influence with our friends outside of the ranks of organized labor to do likewise, and in order that there may be no mistake as to the identity of these two labels we publish them both herewith:



Union Label of the Boot and Shoe Workers' Union.

Every man in the ranks of organized labor who is true to its principles and every man outside of its ranks who believes in living and letting live will see to it that every pair of shoes he buys bears the above label.


THE UNITED HATTERS OF NORTH AMERICA
UNION MADE
REGISTERED

Union Label of the United Hatters of North America.

Every true member of organized labor and every fair-minded citizen outside of its ranks will see to it that he buys no hats but those which bear this label.

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Massachusetts State Branch American Federation of Labor.

The following circular urging the affiliation of all local labor organizations in the State of Massachusetts with the American Federation of Labor, has been issued by the Massachusetts State Branch of the A. F. of L., and its publication requested by that body:

Your Local and Central Labor Union are invited to affiliate with Massachusetts State Branch of the American Federation of Labor.

COST OF AFFILIATION.

No fee is charged to affiliate. It costs one cent per month for each member in your union. The per capita tax begins the month your body affiliates.

Central labor unions pay $1.00 per month, no assessments.

Any union to be represented at the coming State convention to be held at Holyoke, Massachusetts, the second Monday in October, 1909, now organized, must affiliate at least ninety days prior to holding of the convention.

We want all wage earners to be members of the local union of their respective crafts.

All local unions should be affiliated with their national or international unions.

Every local union should be affiliated with the Central Labor Union in their respective location, because, it is for the benefit of the organization, it is for the protection and advancement of the wage earner, it affords an opportunity to discuss questions of interest to the crafts twice a month or oftener if necessary. "Where you go in time of trouble, there you should go in time of peace."

All unions organized in this State should be part of our State Branch of the American Federation of Labor, as all wage earners are benefited by organization.

Twenty-three years ago some of the label trades of this State issued a call for the formation of the Massachusetts State Branch A. F. of L.; they wanted more united action of the organized wage earners of this State; they wanted more and better laws in this State; and then the good work began; considerable has been accomplished since the first meeting. We have assisted in organizing many unions, we have assisted and decidedly advanced the various labels, and the results, higher wages and shorter hours, are being enjoyed by almost every wage earner throughout the State. We stood by the friends of labor and defeated its enemies.

The State Branch of the A. F. of L. has worked hard for legislation in the interest of labor; our Legislative Committee appear before all committees at the State House in matters of interest to the wage earner. Child labor laws were brought about through the work of this organization, and today the child is at school and not in the workshop. Our sanitary conditions that are enforced by law were enacted through the untiring efforts of organized labor in Massachusetts. On the Overtime Bill in textile mills, the Massachusetts State Branch A. F. of L. have done noble work for this law; they started the work by defeating the men who did not stand by organized labor, and their work was a success. Many of the laws referring to labor enacted in the last twenty-three years originated from our State conventions. Much more could be cited here on legislation brought about through the Massachusetts State Branch A. F. of L.

The employers in this State are organized to defeat all legislation that interests organized labor, they keep their agent and attorneys at the State House while the Legislature is in session, and pay them large salaries to introduce bills that will destroy the union label and the rights of union labor.

We want organized labor of Massachusetts to be united; we want their support. If you mean to fight for your rights, let all unions unite with the Massachusetts State Branch A. F. of L. and justice will be shared by all.

Your union is requested to write the secretary the reason why you are not affiliated, and any suggestion as to what can be done to better the State Branch, and what should be done to improve the conditions of your craft.

Hoping we will have your union as a part of the Massachusetts State Branch A. F. of L. in the near future and represented at our next convention, and with the best wishes for the success of your union, I am,

Fraternally yours,
D. D. DRISCOLL, Sec.-Treas.,
P. O. Box C, Station A, Boston.

* * *

The Boot and Shoe Workers' Union is making an honest fight for the rights of its members. If this fight is won it will mean much for organized labor; on the other hand, if the W. L. Douglas Shoe Company wins it may mean the destruction of one of the best organizations in the trades union movement. We can best assist the Boot and Shoe Workers' Union by buying no shoes but those that bear the union label of that organization. A cut of that label appears elsewhere in our reading columns in this issue.

* * *

The United Hatters of North America are engaged in a life and death struggle with the Manufacturers' Association. The very existence of their organization depends on their success in this fight. The very best help we can give these brothers is to refuse to buy any hat that does not bear the union label.

* * *

Funds Needed to Aid in Keeping Gompers, Mitchell and Morrison Out of Jail.

The appeal (published elsewhere in this issue) which the Executive Board of the A. F. of L. makes to organized labor, its friends and sympathizers for financial help in its fight to keep Gompers, Mitchell and Morrison from going to jail should meet with so prompt and so liberal a response as to demonstrate to the tyrants who by such despotic tactics seek to crush trades unionism that before the giant power of labor they are mere pigmies, insignificant, impotent and contemptible.

The mandate of the court consigning Gompers, Mitchell and Morrison to felons' cells and the disgrace of prison uniform is but the sentence of the American plutocracy pronounced upon them through the medium of one Justice Wright because the exercise of their constitutional rights as free American citizens has conflicted with its interests.

When plutocracy sought by legal assassination to destroy the lives of Moyer, Haywood and Pettibone and through their ruthless murder to terrorize wage earners and strike a deadly blow at the cause of unionism, labor arose in its awful might and stayed the hangman's hand.

Now that these men Gompers, Mitchell and Morrison, honest, able, sincere, earnest, self-sacrificing and zealous defenders and advocates of the interests of the toiling masses, are threatened with the degradation of jail imprisonment, it again becomes the great duty of organized labor and its friends to stay the hand of plutocratic tyranny.

The most practical step which the toilers of the country can take with a view to the accomplishment of that end is to contribute each one his share towards the fund that is being raised for the purpose of meeting the expenses of the legal fight necessary to prevent the execution of Wright's sentence. If every member of organized labor will contribute, a trifling sum from each will suffice.

What is now needed most in this fight, brothers, is money. Let us, therefore, in this great crisis each and every one contribute his share to the defense of labor's cause.

* * *

Elsewhere in this issue we publish a cut of the union label of the Boot and Shoe Workers' Union. Buy no shoes unless they bear that label.

* * *

Safety Appliance Law Now in Force in Canal Zone.

President Roosevelt by an executive order has extended the provisions of the safety appliance act and certain of the standard safety rules of the Master Car Builders' Association relating to running boards, ladders, sill steps, roof hand holds, the position of brake shafts, etc., to all of the lines operated in the Panama canal zone and in all government reservations, navy yards, arsenals, etc. The matter of having this rule apply to the railways in the canal zone having been brought to the attention of Secretary Moseley of the Interstate Commerce Commission, Mr. Moseley in a letter to the President explained that the United States government cars and railroads operating in arsenals, navy yards and other government reservations were not equipped with safety appliances in accordance with the requirements of the act, and requested an executive order making it operative therein as well as in the canal zone. In addition to this the secretary recommended that the standards of the Master Car Builders' Association be also made operative therein, and as a result the following executive order was issued:

Executive Order.

Under authority vested in me by law, it is ordered:

1. The requirements of the act of Congress relating to the use on trains of certain described and approved driving wheel and train brakes, couplers, handholds and drawbars of required height for freight cars, approved March 2, 1893 (contained in 27 Statutes at Large, page

531), and known as "An act to promote the safety of employes and travelers upon railroads by compelling common carriers engaged in interstate commerce to equip their cars with automatic couplers and continuous brakes and their locomotives with driving wheel brakes, and for other purposes," as amended by an act approved April 1, 1896 (contained in 29 Statutes at Large, page 85), and as amended by an act approved March 2, 1903 (contained in 32 Statutes at Large, page 943), shall be extended to apply to that zone in the republic of Panama mentioned and described in section 2 of the act of Congress dated June 28, 1902, and entitled "An act to provide for the construction of a canal connecting the waters of the Atlantic and Pacific oceans," and commonly known as the "Canal Zone."

2. The various appliances for the protection of trainmen on freight train cars, with reference to running boards, ladders, sill steps, roof hand holds, and the position of brake shafts, as designated in the existing standards of the Master Car Builders' Association in the United States, shall be used by all carriers in the aforementioned Canal Zone.

3. The equipment and appliances required to be used in sections 1 and 2 of this order shall be constantly and at all times maintained in good and working order, by any and all railroads engaged in the business of a common carrier and operating in the aforementioned Canal Zone.

4. In particular sections 1, 2 and 3 of this order shall be carefully observed and obeyed by the Panama Railroad, a carrier operating in the said Canal Zone.

5. All railroads operated and cars used by the government of the United States within navy yards, arsenals, military reservations, government wharves, and any and all other territories under the jurisdiction of the United States, shall be equipped with the safety appliances required in the safety appliance acts mentioned and described in section 1 of this order, and in the codes of rules mentioned and described in section 2 of this order; and said equipment and appliances shall at all times be maintained in good and working order.

6. This order shall take effect not later than six months from the date of the promulgation thereof.

THEODORE ROOSEVELT.

The White House, January 6, 1909.

Under the above order all lines operating within the Canal Zone as well as all cars and other equipment in government service elsewhere must by July 6, 1909, be fully equipped in accordance with the requirements of the safety appliance act.

By his prompt action in this matter President Roosevelt has rendered the railroad men not only of the Canal Zone but of the entire United States a substantial service. It is but another evidence of his deep interest in their welfare and another act of his in their behalf which they will ever fully appreciate. We congratulate the railroad men of the Canal Zone upon this extension of the application of the safety appliance act as well as all other railroad men in the government service. As a result of the President's action in the matter this act, together with all of its amendments, will be in force as per the provisions of the above executive order in less than six months, the necessity for a special act of Congress to accomplish this end being thereby obviated.

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A Call from the A. F. of L.

For Funds for the Defense of the Appeals in the Pending Injunction Proceedings Against the American Federation of Labor.

To Organized Labor, Its Friends and Sympathizers—Greeting:

The American Federation of Labor, as its name signifies, is a voluntary body composed of national, international and local unions, each of which attends to its own trade business, financial and otherwise, and retains its complete and individual authority and autonomy, while the relationship and purpose of the Federation to the affiliated bodies is to assist them in carrying out trade betterment, to take the initiative in introducing and urging the passage of desirable legislation, and to promote the general welfare. It is thus seen that the American Federation of Labor cannot be considered as holding or having funds in the ordinary routine of its business for unusual purposes. A most unusual and important event has occurred in which extra funds are essential, and an earnest appeal for financial aid is herewith made to you, which will no doubt meet with your prompt and liberal response.

You know that Samuel Gompers, John

Mitchell and Frank Morrison have been declared guilty of violating an injunction issued by the Supreme Court of the District of Columbia, and that Justice Wright, of that court, has sentenced them to terms of imprisonment of twelve, nine and six months, respectively. Pending an appeal they are out on bail. The original injunction issued on the application of the Buck's Stove and Range Company has been appealed to the Court of Appeals of the District of Columbia, and we have authorized our attorneys also to take an appeal against Justice Wright's decision.

We hold that Messrs. Gompers, Mitchell and Morrison have not violated the terms of the injunction, but instead have exercised their right of free press and free speech. These are cardinal principles guaranteed by the Constitution of our country and by our states, and to the maintenance and perpetuity of which we pledge and will exert our every effort.

As stated, there are now two appeals pending. One upon the original injunction and the other from Justice Wright's decision. Should an adverse decision be reached in either or both appeals it will be essential to make further appeals to the Supreme Court of the United States. Surely no member of organized labor or other fair-minded man can rest content unless the principles involved in these cases are determined by the highest tribunal in our land.

We have already expended large sums in these cases, and the plaintiff's attorneys have not only boasted of causing such large expenditures on our part, but have asserted "there are more to come."

We have exceptionally able attorneys in Hon. Alton B. Parker and Messrs. Ralston and Siddons, who will carry the cases to their logical and final conclusion, but ample funds must be provided to permit this to be done.

From the expressions of our fellow workers and friends in all walks of life we find that they are in absolute accord with us in the determined stand taken by Messrs. Gompers, Mitchell and Morrison in the assertion of their and our inalienable rights of free press and free speech and the determination that these cases be pressed to final conclusion. Of course we will fight for our rights through every legitimate and constitutional channel which our system of legislation and law procedure permits, to rectify the injustice of which we complain, and in the meantime, in having these cases appealed and determined, we are confident that we are pursuing the course which commends itself to the men of labor and other friends of human justice.

Eternal vigilance is the price of liberty. In order to permit of proper defense of liberty and freedom as guaranteed to all citizens, WE APPEAL TO ALL LABOR AND TO ALL FRIENDS to make financial contributions for legal defense in these cases before the courts. President Gompers and his colleagues are on trial for your right co-equally with their own, and every liberty-loving citizen in or out of the ranks of labor should consider this situation and appeal as their own personal concern, and response should be made accordingly.

Upon the injunction abuse the Denver convention of the American Federation of Labor declared "That we will exercise all the rights and privileges guaranteed to us by the Constitution and laws of our country, and insist that it is our duty to defend ourselves at all hazards." This appeal for funds is issued in accordance with that declaration.

Send all contributions to FRANK MORRISON, secretary of the American Federation of Labor, 423 G street, northwest, Washington, D. C., who will acknowledge and receipt for the same and make due accounting thereof.

Sincerely and fraternally yours,

SAML. GOMPERS,
President.
FRANK MORRISON,
Secretary.
JAMES DUNCAN,
First Vice-President.
JOHN MITCHELL,
Second Vice-President.
JAMES O'CONNELL,
Third Vice-President.
MAX MORRIS,
Fourth Vice-President.
D. A. HAYES,
Fifth Vice-President.
WM. D. HUBER,
Sixth Vice-President.
JOS. F. VALENTINE,
Seventh Vice-President.
JOHN R. ALPINE,
Eighth Vice-President.
JOHN B. LENNON,
Treasurer.

Executive Council American Federation of Labor.

LINCOLN

"With Malice Toward None;
With Charity For All."

The Nation has celebrated the one hundredth anniversary of Abraham Lincoln's birthday. The story of Lincoln's life from the little log cabin where he was born to the terrible tragedy that was enacted on the night of April 14, 1865, in Ford's Theater, teaches so many lessons of honesty of purpose, philosophical patience under severe trials, wisdom, restraint and commendable ambition as to justify the emulation of any man whose aim is to live right. Since the days of Washington no President has ever been called upon to guide the country through such a stirring and tragic period of its history or to bear the responsibility of solving such abstruse governmental problems as those with which Lincoln had to contend.

While a generous sympathy all-embracing in its scope, a patience that was all-enduring and a humor that was kindly and rich, were most conspicuous amongst his characteristics, they would never have carried him to the great heights of prominence to which he attained had it not been for his untiring energy, unflagging industry and masterful tact, combined with a determination to improve every opportunity.

Of all the able writers who have undertaken to picture Lincoln's character, none of them have been able to reveal it in its varied phases as truly as it is reflected from his own writings. Nowhere does his deep wisdom manifest itself more clearly than when counselling his friends, as is shown in the following extract from a letter written to a young Mr. Herndon:

"I suppose I am now one of the old men; and I declare, on my veracity, which I think is good with you, that nothing could afford me more satisfaction than to learn that you and others of my young friends at home are doing battle in the contest, and endearing themselves to the people, and taking a stand far above any I have ever been able to reach in their admiration. I cannot conceive that other old men feel differently. Of course I cannot demonstrate what I say; but I was young once, and I am sure I was never ungenerously thrust back. I hardly know what to say. The way for a young man to rise is to improve himself every way he can, never suspecting that anybody wishes to hinder him. Allow me to assure you that suspicion and jealousy never did help any man in any situation. There may sometimes be ungenerous attempts to keep a young man down; and they will succeed, too, if he allows his mind to be diverted from its true channel to brood over the attempted injury."

Writing again to the same young man he says:

"You must not wait to be brought forward by the older men. For instance, do you suppose that I should ever have got into notice if I had waited to be hunted up and pushed forward by older men? You young men get together and form a 'Rough and Ready Club,' and have regular meetings and speeches. Take in everybody you can get. . . . As you go along gather up all the shrewd, wild boys about town, whether just of age or a little under age. . . . Let every one play the part he can play best—some speak, some sing, and all 'holler.' "

Other words of wisdom which Lincoln wrote and which show how well he understood the necessity of making himself prominently felt, not at the cost of others but by assisting them and securing their help for himself, are as follows:

" 'A drop of honey catches more flies than a gallon of gall.' So with men. If you would win a man to your cause, first convince him that you are his sincere friend. Therein is a drop of honey that catches his heart, which, say what he will, is the great highroad to his reason, and which when once gained, you will find but little trouble in convincing his judgment of the justice of your cause, if indeed that cause really be a just one. On the contrary, assume to dictate to his judgment, or to command his action, or to mark him as one to be shunned and despised, and he will retreat within himself, close all the avenues to his head and his heart; and though your cause be naked truth itself, transformed to the heaviest lance, harder than steel and sharper than steel can be made, and though you throw it with more than herculean force and precision, you shall be no more able to pierce him than to penetrate the hard shell of a tortoise with a rye straw. Such is man, and so must he be understood by those who would lead him, even to his own best interests."

Lincoln's kindness of heart was not due to any foolish sentimentality. Underneath it all was a spirit of justice, stern and firm, but tempered with mercy. He did not hesitate to administer criticism when he believed it to be necessary. He, however, always endeavored to do so in such a manner as rather to help, stimulate and inspire than to wound, depress or discourage the subject of it, as the following letter will demonstrate:

"Dear Johnston: Your request for eighty dollars I do not think it best to comply with now. At the various times when I have helped you a little you have said to me, 'we can get along very well now;' but in a very short time I find you in the same difficulty again. Now, this can only happen by some defect in your conduct. What that defect is, I think I know. You are not lazy, and still you are an idler. I doubt whether, since I saw you, you have done a good whole day's work in any one day. You do not very much dislike to work, and still you do not work much, merely because it does not seem to you that you could get much for it. This habit of uselessly wasting time is the whole difficulty; it is vastly important to you and still more so to your children, that you should break the habit. It is more important to them, because they have longer to live, and can keep out of an idle habit before they are in it easier than they can get out after they are in.

"You are now in need of some money; and what I propose is, that you shall go to work, 'tooth and nail,' for somebody who will give you money for it. * * * To secure you a fair reward for your labor, I now promise you, that for every dollar you will, between this and the first of May, get for your own labor, I will then give you one other dollar. * * * You say you would almost give your place in heaven for seventy or eighty dollars. Then you value your place in heaven very cheap, for I am sure you can, with the offer I make, get the seventy or eighty dollars for four or five months' work. You say if I will furnish you the money you will deed me the land, and, if you don't pay the money back, you will deliver possession. Nonsense! If you can't now live with the land, how will you then live without it? You have always been kind to me, and I do not mean to be unkind to you. On the contrary, if you will but follow my advice, you will find it worth more than eighty times eighty dollars to you."

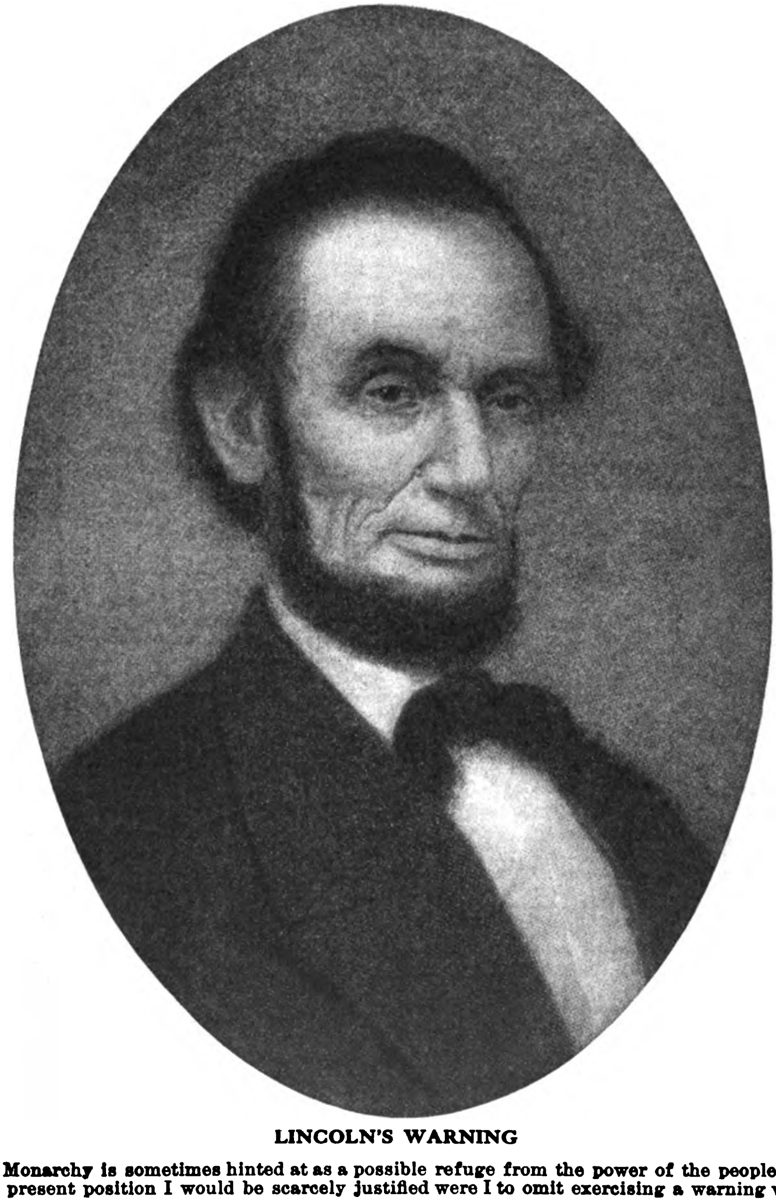
Years later he wrote General Hooker as follows:

"General: I have placed you at the head of the Army of the Potomac. Of course I have done this upon what appeared to me to be sufficient reasons, and yet I think it best for you to know that there are some things in regard to which I am not quite satisfied with you. I believe you to be a brave and skilful soldier, which, of course, I like. I also believe you do not mix politics with your profession, in which you are right. You have confidence in yourself, which is a valuable if not an indispensable quality. You are ambitious, which, within reasonable bounds, does good rather than harm; but I think that during General Burnside's command of the army you have taken counsel of your ambition and thwarted him as much as you could, in which you did a great wrong to the country and to a most meritorious and honorable brother officer. I have heard, in such a way as to believe it, of your recently saying that both the army and the government needed a dictator. Of course it was not for this, but in spite of it, that I have given you the command. Only those generals who gain successes can set up dictators. What I now ask of you is military success, and I will risk the dictatorship. The government will support you to the utmost of its ability, which is neither more nor less than it has done and will do for all commanders. I much fear that the spirit which you have aided to infuse into the army, of criticising their commander and withholding confidence from him, will now turn upon you. I shall assist you as far as I can to put it down. Neither you nor Napoleon, if he were alive again, could get any good out of an army while such a spirit prevails in it; and now beware of rashness. Beware of rashness, but with energy and sleepless vigilance go forward and give us victories."

Such advice, although unpleasant to the recipient, is tendered in a way to win rather his friendship and confidence than his resentment or distrust; its very frankness adds materially to its force, and its character is such that anyone can benefit by the lesson it teaches.

Chief Incidents in Lincoln's Career.

Abraham Lincoln was born in a log cabin in Kentucky on February 12, 1809. When Abe was seven years old the Lincoln family moved to Indiana and settled in Spencer county. For about a year after they took possession of the farm they lived in a shed, after which they moved into a new log cabin. It was not long after they moved into this new log cabin until Abe's mother died, and often he would visit her lonely grave in the forest where he would sit and weep. Quite a distance off there was a log school house in the woods and it was at this school that Lincoln learned to read and write. Soon, however, after acquiring these accomplishments he became his own teacher, devoting himself with great perseverance and industry to his studies, reading his books by the light of the great blazing logs piled upon the open fireplace. The Bible, Life of Washington, a small History of the United States,



LINCOLN'S WARNING

Monarchy is sometimes hinted at as a possible refuge from the power of the people. In my present position I would be scarcely justified were I to omit exercising a warning voice against returning despotism.

There is one point to which I ask attention; it is the effort to place capital on an equal footing with, if not above labor, in the structure of our government. I bid the laboring people to beware of surrendering a power which they already possess, and which, when surrendered, will surely be used to close the door of advancement to such as they, and fix new disabilities and burdens upon them, till all of liberty be lost.

Labor is prior to and independent of capital. Capital is only the fruit of labor and never could have existed had not labor previously existed. Labor is much the superior and deserves much the higher consideration.

Æsops' Fables, Pilgrim's Progress and Robinson Crusoe constituted his library. These books he read over and over until he had whole pages of them committed to memory.

When Lincoln had reached the age of twenty his family moved on a farm in Macon county, not far from Springfield, Illinois. There he helped his father build a log cabin and with the assistance of a man named John Hanks, he split rails with which to fence in a 15-acre corn field. It was from this he gained the soubriquet of "Rail Splitter." Here Lincoln became postmaster and surveyor, studied law and qualified as an attorney, soon after which he was elected to the State Legislature, and so poor was he at that time that he was unable to pay for horse hire and consequently had to walk a distance of 100 miles from New Salem to Vandalia, which was at that time the capital of the State.

He was elected to Congress in 1846, and took his seat in the following year. He became a candidate for United States Senator in 1858, but Judge Douglas, his opponent won. Lincoln was elected President of the United States in 1860, in which office he directed the affairs of the Nation in her darkest hours. In 1864 he was re-elected to the Presidency, and on the 14th day of April, 1865, just at the close of the war, he was assassinated by Booth in Ford's Theater at Washington. He was buried at Springfield, Illinois, where his resting place is marked by a magnificent monument.

President Roosevelt's Eulogy.

It is doubtful that Lincoln's great character and accomplishments have ever been presented in language more forcible or richer in power of expression than that used by President Roosevelt in his speech on February 12th last, (Lincoln's centenary birthday) on the occasion of the laying of the corner stone of the Lincoln Farm Memorial building at the spot where Lincoln was born, and which constituted one of the main features of the Lincoln centenary celebration on the Lincoln homestead near Hodgenville, Kentucky. (The little cabin in which President Lincoln first saw the light of day will be preserved to future generations in the memorial building.)

The President spoke as follows:

"We have met here to celebrate the hundredth anniversary of the birth of one of the two greatest Americans; of one of the two or three greatest men of the nineteenth century; of one of the greatest men in the world's history. This rail splitter, this boy who passed his ungainly youth in the dire poverty of the poorest of the frontier folk, whose rise was by weary and painful labor, lived to lead his people through the burning flames of a struggle from which the nation emerged, purified as by fire, born anew to a loftier life. After long years of iron effort, and of failure that came more often than victory, he at last rose to the leadership of the Republic, at the moment when that leadership had become the stupendous world-task of the time. He grew to know greatness, but never ease. Success came to him, but never happiness, save that which springs from doing well a painful and a vital task. Power was his, but not pleasure. The furrows deepened on his brow, but his eyes were undimmed by either hate or fear. His gaunt shoulders were bowed, but his steel thews never faltered as he bore for a burden the destinies of his people. His great and tender heart shrank from giving pain; and the task allotted him was to pour out like water the life-blood of the young men, and to feel in his every fiber the sorrow of the women.

Not Dismayed by Disaster.

"Disaster saddened but never dismayed him. As the red years of war went by they found him ever doing his duty in the present, ever facing the future with fearless front, high of heart, and dauntless of soul. Unbroken by hatred, unshaken by scorn, he worked and suffered for the people. Triumph was his at the last; and barely had he tasted it before murder found him, and the kindly, patient, fearless eyes were closed forever.

"As a people we are indeed beyond measure fortunate in the characters of the two greatest of our public men, Washington and Lincoln. Widely though they differed in externals, the Virginia landed gentleman and the Kentucky backwoodsman, they were alike in essentials, they were alike in the great qualities which rendered each able to render service to his nation and to all mankind such as no other man of his generation could or did render. Each had lofty ideals, but each in striving to attain these lofty ideals was guided by the soundest common sense. Each possessed inflexible courage in adversity, and a soul wholly unspoiled by prosperity. Each possessed all the gentler virtues commonly exhibited by good men who lack rugged strength of character. Each possessed also all the strong qualities commonly exhibited by those towering masters of mankind who have too often shown themselves devoid of so much as the understanding of the words by which we signify the qualities of duty, of mercy, of devotion to the right, of lofty disinterestedness in battling for the good of others. There have been other men as great and other men as good, but in all the history of mankind, there are no other two great men as good as these, no other two good men as great.

Lincoln Saw the Future.

"Widely though the problems of today differ from the problems set for solution to Washington when he founded this Nation, to Lincoln when he saved it and freed the slave, yet the qualities they showed in meeting these problems are exactly the same as those we should show in doing our work today.

"Lincoln saw into the future with the prophetic imagination usually vouchsafed only to the poet and the seer. He had in him all the lift toward greatness of the visionary, without any of the visionary's fanaticism or egotism, without any of the visionary's narrow jealousy of the practical man and inability to strive in practical fashion for the realization of an ideal. He had the practical man's hard common sense and willingness to adapt means to ends; but there was in him none of that morbid growth of mind and soul which blinds so many practical men to the higher things of life. No more practical man ever lived than this homely backwoods idealist; but he had nothing in common with those practical men whose consciences are warped until they fail to distinguish between good and evil, fail to understand that strength, ability, shrewdness, whether in the world of business or of politics, only serve to make their possessor a more noxious, a more evil member of the community, if they are not guided and controlled by a fine and high moral sense.

Denounced by the Timid.

"We of this day must try to solve many social and industrial problems, requiring to an especial degree the combination of indomitable resolution with cool-headed sanity. We can profit by the way in which Lincoln used both these traits as he strove for reform. We can learn much of value from the very attacks which following that course brought upon his head, attacks alike by the extremists of revolution and by the extremists of reaction. He never wavered in devotion to his principles, in his love for the Union, and in his abhorrence of slavery. Timid and lukewarm people were always denouncing him because he was too extreme, but as a matter of fact he never went to extremes, he worked step by step, and because of this the extremists hated and denounced him with a fervor which now seems to us fantastic in its deification of the unreal and the impossible. At the very time when one side was holding him up as the apostle of social revolution because he was against slavery, the leading abolitionists denounced him as the "slave hound of Illinois." When he was the second time candidate for President, the majority of his opponents atacked him because of what they termed his extreme radicalism, while a minority threatened to bolt his nomination because he was not radical enough. He had continually to check those who wished to go forward too fast, at the very time that he overrode the opposition of those who wished not to go forward at all. The goal was never dim before his vision, but he picked his way cautiously, without either halt or hurry, as he strode toward it, through such a morass of difficulty that no man of less courage would have attempted it, while it would surely have overwhelmed any man of judgment less serene.

Days Great and Terrible.

"Yet perhaps the most wonderful thing of all, and, from the standpoint of the America of today and of the future, the most vitally important, was the extraordinary way in which Lincoln could fight valiantly against what he deemed wrong and yet preserve undiminished his love and respect for the brother from whom he differed. In the hour of a triumph that would have turned any weaker man's head, in the heat of a struggle which spurred many a good man to dreadful vindictiveness, he said truthfully that so long as he had been in his office he had never willingly planted a thorn in any man's bosom, and besought his supporters to study the incidents of the trial through which they were passing as philosophy from which to learn wisdom and not as wrongs to be avenged; ending with the solemn exhortation that, as the strife was over, all should reunite in a common effort to save their common country.

"He lived in days that were great and terrible, when brother fought against brother for what each sincerely deemed to be the right. In a contest so grim the strong men who alone can carry it through are rarely able to do justice to the deep convictions of those with whom they grapple in mortal strife. At such times men see through a glass darkly; to only the rarest and loftiest spirits is vouchsafed that clear vision which gradually comes to all, even to the lesser, as the struggle fades into distance, and wounds are forgotten, and peace creeps back to the hearts that were hurt.

His Supreme Vision.

"But to Lincoln was given this supreme vision. He did not hate the man from whom he differed. Weakness was as foreign as wickedness to his strong, gentle nature; but his courage was of a quality so high that it needed no bolstering of dark passion. He saw clearly that the same high qualities, the same courage, and willingness for self-sacrifice and devotion to the right as it was given them to see the right, belonged both to the men of the North and to the men of the South. As the years roll by, and as all of us, wherever we dwell, grow to feel an equal pride in the valor and self-devotion, alike of the men who wore the blue and the men who wore the gray, so this whole nation will grow to feel a peculiar sense of pride in the man whose blood was shed for the union of his people and for the freedom of a race; the lover of his country and of all mankind; the mightiest of the mighty men who mastered the mighty days, Abraham Lincoln."

TRIBUTE FROM A SOUTHERN SOLDIER.

What is probably one of the most significant tributes which has been paid to Lincoln from a national standpoint is that recently tendered by Henry Watterson, "a Southern man and a Confederate soldier," and which appears in a late issue of "The Cosmopolitan." Colonel Watterson describes Lincoln as he saw him in Washington just before the war as a "wholly resolute man." But of his attitude both then and during the struggle he says:

"Throughout the contention that preceded the war, amid the passions inevitable to the war itself, not one bitter, proscriptive word escaped his lips or fell from his pen, while there was hardly a day that he was not projecting his great personality between some Southern man or woman and danger."

Regarding Lincoln's attitude towards slavery and his desire and readiness to bring about reconciliation and reunion on a basis of compensation to the slaveowners for the losses they would necessarily suffer in consequence of emancipation and of the inestimable loss that the entire country, both North and South, suffered as a result of his untimely death, Colonel Watterson feelingly writes as follows:

"He stood in awe of the Constitution and his oath of office. Hating slavery, he recognized its legal existence and its rights under the compact of the organic law. He wanted gradually to extinguish it, not to despoil those who held it as a property interest. He was so faithful to these principles that he approached emancipation not only with anxious deliberation, but with many misgivings. He issued his final proclamation as a military necessity; and even then, so fair was his nature, he was meditating some kind of restitution. . . .

"After that famous Hampton-Roads conference, when the Confederate commissioners, Vice-President Stephens, Campbell, and Hunter, had traversed the field of official routine with Mr. Lincoln and Mr. Seward, Lincoln took the 'slim, pale-faced consumptive man' aside and, pointing to a sheet of paper he held in his hand, said, 'Stephens, let me write "Union" at the top of that page, and you may write below it whatever else you please.' . . . Mr. Lincoln took with him to Fortress Monroe two documents that still exist in his own handwriting; one of them a joint resolution to be passed by the two houses of Congress appropriating the $400,000,000, the other a proclamation to be issued by himself when the joint resolution had been enacted. These formed no part of the discussion at Hampton-Roads, because Mr. Stephens told Mr. Lincoln they were limited to treating upon the basis of the recognition of the Confederacy. 'In that case, Stephens,' said Lincoln sadly, 'I am guiltless of every drop of blood that may be shed from this onward.' . . .

"Had Lincoln lived? In that event it is quite certain that there would have been no era of reconstruction, with its repressive agencies and oppressive legislation. If Lincoln had lived there would have been wanting to the extremism of the time the bloody cue of his taking off to mount the steeds and spur the flanks of vengeance. For Lincoln entertained, with respect to the rehabilitation of the Union, the single wish that the Southern States—to use his familiar phraseology—'should came back home and behave themselves,' and if he had lived he would have made his wish effectual as he made everything effectual to which he seriously addressed himself."

* * * * *

Contributed

MINNESOTA EMPLOYERS' AND EMPLOYES' ORGANIZATIONS PROPOSE SOLUTION FOR WEIGHTY PROBLEM—PLAN TO PROVIDE COMPENSATION FOR EMPLOYES INJURED IN THE COURSE OF THEIR EMPLOYMENT

A memorial, or petition, drafted and signed by the representative of the several labor organizations of the State of Minnesota, together with the representative of the Minnesota Employers' Association, is as follows:

PETITION SUGGESTING PLANS FOR LEGISLATION LOOKING TOWARD COMPENSATION OF EMPLOYES FOR INJURIES RECEIVED IN THE COURSE OF THEIR EMPLOYMENT.

John A. Johnson, as Governor of Minnesota:

Honored Sir—The undersigned, representing respectively the Minnesota Employers' Association and the various labor organizations as shown by their signatures, hereto respectfully petition your excellency to suggest in proper form to the legislature of Minnesota, now in session, the passage of laws to the following effect:

1. An act appointing a nonpartisan commission of three members, one of whom shall be a representative of employers, another of whom shall be a representative of employes, and a third a neutral and studious member, empowering them at the expense of the state to thoroughly investigate the propriety of transforming the present system of compensation to employes from the basis of negligence to that of a risk of the industry, and to report to the governor before the next session of the legislature a plan for such change, if possible, consistent with our constitutional systems, and equitable as between the employer, the employe and the state.

2. An act requiring all employers, and employes, too (in so far as possible), and all policemen and firemen, and hospitals and doctors rendering relief to the injured or deceased, to report the natures and the causes of the accidents with reasonable details, including wages, through proper channels to enable the statistics to be gotten by the labor department of this state, and the accidents classified according to the various industries to get a proper basis from which the commission may determine and include an equitable system in its report.

Our reasons for this petition are, briefly stated:

1. That there are a great many thousand accidents in this state, the exact number of which and the classified reasons therefor cannot from any data now made be obtained; there were in 1907 92,178 either killed or injured throughout the United States in the course of their employment on 229,951 miles of single track railroads, or about one for each two and one-half miles of road operated. The general list in all industries is many times as great. This single year killed and crippled about five and one-half times as many in the peaceful occupation of railroading as were killed and injured upon the Union side in the hostile occupation of war at the battle of Gettysburg. There is every reason to believe that Minnesota has had at least her proportion of these accidents, and the information should be placed at the disposal of the commission.

2. We are convinced that a majority of the accidents that now happen in the course of employment occur by reason of the dangers incident to the employments, and without fault upon the part of either the employer or the employe; this, under our present system, prevents any recovery by the employe for his injuries in a majority of the cases if he prosecutes his claim from an honest standpoint, and he ought not to be tempted to prosecute it from any other standpoint.

3. The employe essentially is forced to bear the pain, physical suffering and privations incident to all such physical

injuries, and at the present time he is required to assume also the financial risk incident to such accidents.

4. The injured is not certain that he can recover when he is injured; he must give from one-quarter to one-half of what he does recover, if at all, to pay for the expenses and fees of his litigation necessarily taken upon a contingent basis, as a general thing.

5. A very small percentage of the amount which the employer now pays to secure himself against accidents actually goes now to compensate the man who is actually injured, and this goes in such uneven proportions and in such times and amounts as to render very little aid to the injured and those dependent upon him at the times and under the circumstances when most needed.

6. The economic loss between what it costs the employer and that which the employe receives is altogether too great to be consistent with even reasonable business expenses or methods.

7. To the employer the question of whether there is a liability for an accident cannot be definitely answered; when there is a liability the amount of recovery that can be had is destructively uncertain; great financial risks and expenses must be taken by the employer in the way of insurance, counsel fees and otherwise; he is badly burdened, yet not secure. With him an accident means a lawsuit which often cannot be fairly settled and which he must fight, although it hurts his conscience, creates bad mutual feelings and is a mere gamble as to results.

8. The cases that are tried are often matters of speculation as to whether they come within the rules of law allowing them to be submitted to juries, and verdicts are seldom alike on the same facts; the line of law is often so closely drawn that the courts must almost guess at the right of recovery or defense.

9. The slight change of the situation of parties or objects, or the failure to give or the giving of verbal directions are so easily forgotten and changed, and so often controlling that great temptations to use unconscionable methods both by the prosecution and defense results from the uncertainties of accidents to the unfortunates.

10. Accidents now generally mean lawsuits; such lawsuits mean speculation; such speculation means hostility, if not disruption between employer and employe—it leaves both parties in such constant fear and apprehension that their mutual interests cannot be best preserved and furthered.

11. The public is put to great expense in the administration of its courts, its hospitals, its charitable institutions, and the individual citizens are greatly harassed by private charity as a result. The foreigner is invited and comes with his labor; there is little mutual acquaintance or knowledge between him and the employer; the employer's duties must be delegated; their relations are not always friendly; an injury occurs; insurance is carried; speculative agents acquire a lien upon the injured's cause of action; they may not be willing to settle at a fair compensation, and if they do, take a large proportion of the funds; the insurance company steps in and removes the humanitarian features and feelings one degree further; its subagents are anxious to make records irrespective of the merits—it is a business proposition from both sides from which both are willing to sacrifice feeling, sympathy and necessity for the sake of a speculative lawsuit, which in any event is essentially destructive of the mutual feeling between the employer and the employe, and hazardous in its financial consequences to both.

12. None can study the question fairly, honestly and intelligently without being impressed with the simple fact that the present system is altogether wrong and unsatisfactory in that it has an entirely wrong basis to meet the present conditions.

13. Twenty-two foreign countries, consisting of the following: Austria, Belgium, British Columbia, Cape of Good Hope, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Luxemburg, Netherlands, New Zealand, Norway, Queensland, Russia, South Australia, Spain, Sweden and Western Australia, have adopted systems more or less in conformity with the idea of changing the basis from that of negligence or fault to that of rightful compensation or insurable risk as an incident of the business as is a fire insurance risk.

The government of the United States has attempted legislation looking toward this end in providing compensation for injuries received upon the isthmian canal, in legislating with respect to interstate commerce, and there are now we understand two bills before Congress attempting to work out some such system as we suggest.

15. A commission was appointed in the State of Illinois in the year 1905 to prepare and report a proper bill to the governor of that state, and upon careful investigation reported two forms of bills, neither of which, as we are informed, has yet passed. A similar bill was drafted in New York, but has not passed. Massachusetts has had a commission to investigate this among other labor questions in recent years, and various other states, notably Wisconsin, have been gathering information looking toward the same end.

16. The President of the United States, as well as the labor commissioner at Washington, has called the attention of Congress to the fact that the federal and state governments of America are notably behind the remainder of the civilized world upon this question, and that it is a matter of humiliation in international conferences so far as the federal government is concerned.

We have been trying for some time to ascertain, as have others in this state, notably the State Bar Association, what would be proper legislation to meet the demands of this situation, and have come to the conclusion that our interests are to a large extent mutual, as are the interests of the public.

We believe that legislation along the lines that would change the basis of recovery from that of fault (which essentially accuses a man's good faith or his ability) to that of shifting the financial risk as a certainty upon the employer, like other expenses of the business, and relieving him of the hazardous uncertainties and expenses incident to present methods of defense, would leave both parties and the state in reasonably satisfactory condition without imposing upon the employer that degree of taxation which would either tend to drive industries from or keep them out of this state as a result.

We are satisfied, too, that this is a subject of such importance and complexity that no better service could be done to the state than to give to it a reasonable means of investigation and a competent commission to make that investigation.

We therefore recommend that in some appropriate way you may see fit to transmit a request to the legislature for the bills above indicated, that the state may know after the study necessary upon a subject of this importance, what legislatoin should be enacted to meet the exigencies of the situation.

Respectfully submitted,
MINNESOTA EMPLOYERS' ASSN.
GEO. H. GILLETTE, President.
Dated January 21, 1909.
MINNESOTA STATE FEDERATION OF LABOR.
GEO. B. HOWLEY, President.
W. E. MCEWEN, State Commissioner of Labor.
A. E. KELLINGTON, Sec'y-Treas. Flour Mill Employes' Int. U.
D. J. HAYES, B. of L. E.
E. C. HALL, Sec'y.-Treas. State Blue Label League.
D. WOODS,
M. P. LARSON,
J. A. COCHRAN,
B. of L. F. and E.
A. L. RICH, Pres. Local No. 36, Int. Steam Eng. Union, St. Paul, Minn.
T. J. MCGRATH, B. of R. T.
G. N. BECKER, *St. P. T. and L.* Assn.
G. W. DEACON, Sec'y-Treas. Legislative Committee, Minnesota State Federation of Labor.

The following are the minutes of meeting held on employers' and employes' compensation legislation, dated Minneapolis, Minn., January 21, 1909:

"After signing a memorial to the governor it was moved, seconded and carried:

"That it is the mutual understanding of all of the parties signing the said memorial that they will each use their influence to carry the same out in good faith and to undertake no legislation upon the subject except along the lines indicated until a fair opportunity to construct such legislation is made, and that any substantial breach of this understanding by either of the interested parties may be treated by the other as relieving them from further support of this theory.

(Signed)
W. E. MCEWEN,
Comissioner of Labor.
MINNESOTA EMPLOYERS' ASSN.
GEO. H. GILLETTE, Pres."

The aforesaid document was finally agreed upon after a number of conferences between those signing the petition, together with a committee of the Minnesota State Bar Association, who voluntarily appointed a committee to work in conjunction with the committee of employes and employers along the line of a liability law as set forth in the memorial. The said memorial was presented to the governor, the Hon. John A. Johnson, of Minnesota, on January 25, 1909, by Mr. W. E. McEwen, commissioner of labor, also secretary and treasurer of the State Federation of Labor, accompanied by the following letter:

"ST. PAUL, MINN., Jan. 25, 1909.

"*Hon. John A. Johnson, Governor of Minnesota:*

"Dear Sir—I have the honor to transmit to you the attached petition, signed jointly by the accredited officials of the representative organizations of employers and laborers within the State of Minnesota, who, with the undersigned, join in the request that you present the same to the legislature now in session. The subject matter is a plan mutually regarded by your petitioners as the initiatory step for a more just and equitable adjustment for claims arising out of injuries sustained to laborers in industries within this state.

"The petition is self-explanatory, but it may not be out of place to state that the interests whose representatives join in this prayer have not always heretofore worked in harmony. It is the first time in recent years that they have conferred together, but each seemed to recognize that concerted action is imperative to secure the relief necessary to protect both labor and industry from the injustice growing out of the present obsolete method of settling personal injury claims, and the first fruit of their co-operation is the petition and plan presented herewith.

"The problem of justly caring for industry's toll of workmen is the great social question of the hour, and I am sure you will recognize the importance of calling the attention of the legislature to this proposal for a solution offered on the part of Minnesota's employers and laborers by their official representatives. Respectfully submitted,

W. E. MCEWEN,
Commissioner of Labor."

The idea of transforming the present system of compensation to employes from the basis of negligence to that of a risk of the industry in which such employes may be engaged is not entirely new in this country. It was brought to our attention that attempts have been made in several states to enact laws of this nature, but somehow or other these laws have not yet been born.

The committee found on investigation that a peculiar condition existed in the state, in that the people in the state, the courts, the members of the bar association, the hospital and public charities, the employers and employes were dissatisfied with present conditions, and that the time had come in which to get a law enacted that would be a just measure to all concerned. Such a law to tax the liabilities against the industries of the state, the money to be collected the same as any other taxes and paid into the state treasury, and a commission appointed by the state to settle liability claims. However, under no circumstances would said commission have the power to say how much each claimant should receive, but all claims would be settled in accordance with a schedule formulated for that purpose.

It is also understood between the members of the committee that these claims would be paid in a manner similar to a pension system so as to render due protection to the state. It is a recognized fact that when a poor man receives a large sum of money at any one time it is very apt in the course of a few years to get away from him, not necessarily through any particular fault of his own but through his lack of business ability in entrusting his money to some one who will take advantage of the situation, and in most cases the poor man will be the loser. As the state is the final resource and must in due time step in and take care of its poor and crippled, we recognize the fact that in enacting a law of this nature it should be made so broad as to be just to everybody, and a pension system was agreed upon as being the most just and reliable to all concerned.

NELS P. LARSEN,
Sec. and Treas. Minnesota State Legislative Board.

COMPENSATION FOR THE JUDICIALLY DISINHERITED

An article addressed to locomotive firemen and enginemen does not need to prove the inherent risk of their occupation, nor does it need to show that the number of killed and injured is of a steadily recurring statistical ratio. The following tables, which are compiled from figures shown in the annual report of railways in the United States, issued by the Interstate Commerce Commission, prove this beyond a doubt. These basic figures are authentic, since they are based upon the returns made by the carriers themselves, who would not overestimate the number of employes they killed and injured. They include all classes of employes in respect of which the carriers are bound to report to the Interstate Commerce Commission.

The persons thus killed and injured have to bear the loss which indirectly falls as a burden on the entire community. In its present form this loss is borne directly by those least able to bear it, because of the absurd notions and the theory which the judges have evolved and which has become known as the law of master and servant. This system of administering the law is based upon the assumption that the so-called negligence is synonymous with recklessness, and delays in the law amount to a denial of justice. A typical instance may be found in the Kane case following:

On the morning of December 16, 1897, after daylight, Thomas M. Kane was killed. The decedent, 29 years of age, was a fireman on an engine of the Erie Railroad Company, earning seventy dollars a month. He left surviving a widow 26 years of age and one child three years of age. At the time of the collision Kane was at the front end of the locomotive engaged in cleaning the number of the engine. The collision drove a gon-

SUMMARY A.—*Comparative statement of accidents to railway employees for the years named.*

[Compiled from figures shown in the Annual Reports of Statistics of Railways in the United States, issued by the Interstate Commerce Commission.]

Year ending June 30—	Employees killed.		Employees injured.		Total employees killed or injured.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
1907	4,534	8.55	87,644	10.79	92,178	10.65
1906	3,929	7.41	76,701	9.44	80,630	9.32
1905	3,361	6.34	66,833	8.23	70,194	8.11
1904	3,632	6.85	67,067	8.26	70,699	8.17
1903	3,606	6.80	60,481	7.44	64,087	7.40
1902	2,969	5.60	50,524	6.22	53,493	6.18
1901	2,675	5.04	41,142	5.06	43,817	5.06
1900	2,550	4.81	39,643	4.88	42,193	4.87
1899	2,210	4.16	34,923	4.30	37,133	4.29
1898	1,958	3.69	31,761	3.91	33,719	3.90
1897	1,693	3.19	27,667	3.40	29,360	3.39
1896	1,861	3.51	29,969	3.69	31,830	3.68
1895	1,811	3.41	25,696	3.16	27,507	3.18
1894	1,823	3.44	23,422	2.89	25,245	2.92
1893	2,727	5.14	31,729	3.90	34,456	3.98
1892	2,554	4.81	28,267	3.48	30,821	3.57
1891	2,660	5.01	26,140	3.23	28,800	3.33
1890	2,451	4.62	22,396	2.76	24,847	2.88
1889	1,972	3.72	20,028	2.47	22,000	2.55
1888	2,070	3.90	20,148	2.49	22,218	2.57
Total	53,046	100.00	812,181	100.00	865,227	100.00

ANALYSIS OF SUMMARIES.

Summary A.—The first summary presented shows the number of railway employees killed, the number injured, and the total casualties for twenty years from 1888, the first year after the establishment of the Interstate Commerce Commission, to 1907, inclusive. During this period 53,046 employees lost their lives at the post of duty and over 800,000 employees were either maimed or crippled. The total casualties numbered 865,227, an average for the twenty years covered of over 43,000 a year. The per cent. column is introduced to facilitate comparison of the years given with the total figures for the entire period.

SUMMARY B.—*Comparative statement of accidents to railway employees showing the number of minutes elapsing for one employee killed or injured, and the average number employees killed or injured per day, for the years named.*

[Compiled from figures shown in the annual reports of Statistics of Railways in the United States, issued by the Interstate Commerce Commission.]

Year ending June 30—	Employees killed.			Employees injured.			Total employees killed or injured.		
	Number.	Number minutes elapsing for one killed.	Average per day.	Number.	Number minutes elapsing for one injured.	Average per day.	Number.	Number minutes elapsing for one killed or injured.	Average per day.
1907	4,534	116	12	87,644	6	240	92,178	6	252
1906	3,929	134	11	76,701	7	210	80,630	7	221
1705	3,361	156	9	66,833	8	183	70,194	7	192
1904	3,632	145	10	67,067	8	183	70,699	7	193
1903	3,606	146	10	60,481	9	166	64,087	8	176
1902	2,969	177	8	50,524	10	138	53,493	10	146
1901	2,675	196	7	41,142	13	113	43,817	12	120
1900	2,550	207	7	39,643	13	108	42,193	12	115
1899	2,210	238	6	34,923	15	96	37,133	14	102
1898	1,958	268	5	31,761	17	87	33,719	16	92
1897	1,693	310	5	27,667	19	76	29,360	18	81
1896	1,861	283	5	29,969	18	82	31,830	17	87
1895	1,811	290	5	25,696	21	70	27,507	19	75
1894	1,823	288	5	23,422	22	64	25,245	21	69
1893	2,727	193	7	31,729	17	87	34,456	15	94
1892	2,554	206	7	28,267	19	77	30,821	17	84
1891	2,660	198	7	26,140	20	72	28,800	18	79
1890	2,451	214	7	22,396	23	61	24,847	21	68
1889	1,972	266	5	20,028	26	55	22,000	24	60
1888	2,070	255	6	20,148	26	55	22,218	24	61
Total	53,046			812,181			865,227		
Average		214	7		16	111		15	133

Summary B.—This summary shows the number of minutes elapsing for each casualty and the average number of casualties per day. Approximately every time seven minutes of every hour of every day elapsed for the last four years named 1 employee was killed or injured. During the twenty years covered the average was 1 killed or injured for every fifteen minutes of this entire period The average killed each day for the whole period covered was 7 and the average injured 111.

dola car upon the engine, caught Kane and killed him instantaneously. (Volume 118, Federal Reporter, 224.)

In the meantime ten volumes of Federal Reporters were filling up with cases, and on page 474, volume 128, another report of the same action is found. This decision is dated April 4, 1904, seven years after Kane was killed. The district judge in that case held the relevant section of the Ohio Revised Statutes unconstitutional, so that Kane's widow lost her case. That decision was reversed by the Circuit Court of Appeals December 12, 1904 (133 Fed. Rep. 682). The Circuit Court of Appeals again had the case before it on the 19th of January, 1906 (142 Fed. Rep. 682), stating this makes the third time this case has been before this court. On the last trial Judge Cockran, who sat below, directed a verdict for the defendant on two grounds: First, that the act of April 2, 1890, does not apply, because Bowker, the negligent engineer, while in control of his fireman was not in charge of all the employes on the train, there being a conductor; and second, because the deceased fireman, Thomas M. Kane, was guilty of contributory negligence in putting himself in a dangerous place on the engine in front of the boiler, between it and the gondola car, where he was liable to be caught if a collision occurred. The Circuit Court of Appeals reversed the opinion of Judge Cockran, remanded the case for further proceedings, which was followed by another trial. A fourth appeal to the Circuit Court of Appeals on June 26, 1907 (155 Fed. Rep. 119), resulted in the affirmance of the judgment which the widow of Kane had obtained.

The Erie Railroad Company, in order to preserve its rights at common law and to conserve the rights of the "widows and orphans" who owned its stocks and bonds, took the case to the Supreme Court of the United States, which on November 11, 1907, denied the petition for a writ of certiorari and thus put an end to this litigation (207 U. S. 593).

The administratrix, in this case the widow of Kane, had had her day in court and had received due process of master and servant's law, but she had been kept waiting for justice for nine years ten months and twenty-seven days.

It is but too probable that Kane's

widow was well able to get along in the ten years' interval on the accumulated savings of the killed fireman, so that what might, under ordinary circumstances in the case of a person not able to enjoy the luxury of litigation, have amounted to a denial of justice would not in this case result in lowering the standard of life of his family.

This is not an isolated instance of the natural delay in the determination of this class of cases. In the case of Taylor's widow (210 U. S. 281) several trials were had in the Supreme Court of Arkansas before the case finally went to the Supreme Court of the United States. In the case of Schlemmer's widow (205 U. S. 18) the injury occurred in August, 1900, and the action has not yet been definitely determined in the Pennsylvania courts, although nine years have elapsed since Schlemmer was crushed to death in coupling a shovel car to a caboose. The Supreme Court of the United States ordered a new trial on March 4, 1907, and the case is on its route of indeterminable delay awaiting another final decision.

Any person who has ever taken the trouble to look through the law on the Measure of Damages, by Voorheis, or the thousands of cases cited by Joyce on Damages, construing nearly every word of every statute passed to relieve employes from the horrors of the common law, will appreciate the entire absurdity of a civilized community continuing to do business with such archaic, unjust and dangerously one-sided laws being maintained in the mistaken interest of those who have put their moneys into corporations, and who are responsible for maintaining these conditions.

Justice is a perpetual desire to render unto each person his due. The corporations themselves are only artificial entities created by law for the purpose of allowing individuals to do business under that form. The real persons in interest are the stockholders. The stockholders are the fellow citizens of those killed and injured. In the last analysis the injuries inflicted on 1,672,074 employes of railways engaged in interstate commerce is bound to react as a wrong upon the stockholders who may be made to believe that their financial interests are subserved when their corporation, by chicane and trickery, delays a widow from obtaining damages for the killing of the railway employe. In contradistinction to the practical denial of justice to the railway employes it is well to note that when the corporations are threatened by strikes or by interruption of their interstate commerce speedy justice is awarded. The writs of injunction used in the Debs, in the Phelan and all other cases when employes interfered with their carrier's property, show that the corporation obtains swift and unerring justice. Yet the citizens who are injured while working for these corporations, and when they are killed their wives, are subjected to a ten years' delay in obtaining damages. Is a ten years' delay in conformity with that mandate of Magna Charta which declares when translated, "To no man will we sell, to no man will we *deny or delay right or justice*," which the courts properly call due process of law? Practically any one except a person so enamored with the theories of the decisions founded on judge-made law rather than with the subject matter of rendering speedy and undelayed right and justice is bound to say that an administration of law that brings about such results is to all practical intents a denial of justice. The present system of administering the law of master and servant makes for inevitable delay at a time when prompt compensation of a definite amount is a thing most needed by the victim of industrial activity. The absence of such a system of prompt, just and certain compensation judicially disinherits millions of men, throws their families on the world unprotected when most in need, seldom, if ever, gives them any justice unless a resort to legalized delay and absurd hairsplitting on indifferent matters when lives and limbs of men have been sacrificed is to be maintained as our standard of justice. The present system of administration of the law of master and servant degrades the injured employes by making them objects of charity when their injuries were obtained in a quasi-public service, and when they die of their injuries reduces their survivors in their social standards so that it virtually mocks the misfortune of the persons through whose social service the community at large exists from day to day and through whose efforts the commerce of the country is moved.

Heretofore the United States and every state in the United States has neglected its social duty in protecting the persons engaged in dangerous occupations. The inherent dangers which follow the use of modern machinery claim a recurring number of lives and limbs in mines, quarries, chemical factories and wherever huge machinery or noxious forces are operated by mere men apt to become tired and worn out in their occupation. Against all these dangers civilized states have legislated by requiring the industry itself to bear as a part of its cost of production or cost of the many expenses of the enterprise, compensation for those killed or injured or disabled in the prosecution thereof. The federal government can regulate only such parts of the industrial life of the community as is directly committed to its regulation by the Constitution, viz., interstate commerce or the traffic on its post route. The correlative duty of the United States to protect the persons engaged in moving interstate commerce or hauling mail trains on post routes has never before been the subject of any one comprehensive enactment put on an absolutely safe constitutional basis of rigorous justice to both the employes and the corporation.

The law of master and servant in its present form as administered by state and federal courts is based on decisions by judges who utterly miscalculated and misunderstood the effect of their decisions upon the economic life of the community. In the early thirties of the nineteenth century—or seventy years ago —in England and in Massachusetts and South Carolina three judges made the law by declaring, in respect of the relation of master and servant applied to dangerous occupations, that what they decreed or adjudged was the public policy of the law. Whether it was owing to the growing strength of the newly enfranchised middle class, or whether it was a simple disregard of the rights of the workingmen, or whether it was an utter misapprehension of the consequences of their rulings, the decisions of these judges became the rule of law regulating the relation of master and servant which each set of judges in imitative mimicry and submission applied, claiming that it had that peculiar sanctity which a time-worn precedent, in respect of feudal property rights, might possibly be deemed to have acquired. The fact that millions of English speaking workingmen were subjected to the horrors flowing from these decisions simply shows their submissiveness to great and recurring wrong. Isolated instances exist of judges attempting to introduce amelioration to certain phases in the administration of this law. Of these judges the Hon. Henry C. Caldwell, circuit judge of the eighth circuit, stands out pre-eminent. Yet all these attempts to mitigate the horrors of the administration of the common law could bring about no relief because the entire theory of that law was opposed to the principle of modern industrial development quite as thoroughly as the form and the theory upon which slavery was based. Both chattel slavery of black men and the ruthless exploitation of white men are unsound and unjust because each person should have the right to his life, limbs and health unimpaired, and when he is ruthlessly exploited the whole community suffers because the humanity common to us all is made a subject of traffic and degrading exploitation. The injustice of the judge-made law of master and servant has been mitigated in limited degrees by various plasters, poultices and external applications to what in reality is a cancerous growth. The so-called fellow servant laws, the vice-principal rule, the various acts which attempt to abolish assumption of risk, then permit the defense of contributory negligence, the various inspection and factory acts, and mine regulation acts, all show that the community at large has felt the total injustice of the prevailing system of administering a judge-made law of master and servant when the fellow citizens of all these persons are being unjustly exploited: yet all these statutes are then construed as being in derogation of the common law. Since the judges both practically legislated and declared the common law in respect of master and servant, all benefits meant to be given to the employes by such acts will always be construed as in derogation of their sacred rights at common law to be maimed, killed or injured, and to sue in courts of law. Every attempt to benefit the workingmen, and thus the people at large, by trying to ingraft exceptions upon the rules so laid down by the courts existing and administered by the judges who evolved these pernicious doctrines, is bound to again lead to unsettled distinctions, whittling down of rights and frittering away of the benefits sought to be conferred by legislation on the persons at risk.

A break with the entire systematized injustice embodied in the common law doctrine of master and servant had to come. The Germans, following the lead of Prussia, blazed the way. At the same time the English speaking judges were mistaking public policy and were laying down decisions which logically led to a system whereby a period of ten years was necessary to establish the right of the widow of the individual injured, Prussia had begun an entirely different system of administering the law of master and servant. The Prussian system of justice ultimately led to the enactment of the compensation acts in Germany. Under the German system every dangerous enterprise must bear as part of its gross expenses the cost of promptly paying annuities to the survivors of its employes killed, as well as annuities to those injured or wrecked in their health while in its employ.

England was forced to follow suit and has adopted a general compensation act, 6 Edward VII, chap. 58, 21st December, 1906, and with the exception of Turkey, every state in Europe has finally adopted a more civilized method of recognizing its social duty towards its citizens than has the United States or any one of the states.

The scope of this article does not permit a detailed elaboration of foreign systems. Very readable matter on this subject can be found in—

Speech of Hon. George A. Bartlett, Congressional Record, 60th Congress, 1st session, volume 42, part 8, page 333.

Also appendix, by Launcelot Packer, pages 334 to 363.

Also speech by Hon. Adolph J. Sabath, page 378.

Also articles in Everybody's Magazine, September and October, 1908, by Mr. Harr, on the Pensioners of Peace.

Also Mr. Lewis on Employers' Liability, Atlantic Monthly, January, 1909.

And the messages of President Roosevelt.

In Mr. Sabath's remarks on the compensation bill there appeared the following well-deserved tribute to President Roosevelt's efforts in this matter:

> It is to the credit of President Roosevelt that he has perceived the essential injustice of this situation and has earnestly endeavored to correct it, not alone by advocating the passage of employers' liability and workmen's compensation acts, but by insisting upon a rigid enforcement of federal statutes calculated to reduce the number of accidents, as well as pointing out the need of strengthening or supplementing such legislation in the interest of greater safety.
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> The keynote of this effort was struck by the President in his Georgia day speech at Jamestown, when, on June 10, 1907, in discussing the question of industrial accidents, he said:
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> Legislation should be had, alike from the nation and from the states, not only to guard against the needless multiplication of these accidents, but to relieve the financial suffering due to them. . . . . It is neither just, expedient nor humane, it is revolting to judgment and sentiment alike, that the financial burden of accidents occurring because of the necessary exigencies of their daily occupation should be thrust upon those sufferers who are least able to bear it, and that such remedy as is theirs should only be obtained by litigation which now burdens our courts.

The second session of the 60th Congress will be notable for the introduction of a compensation bill (H. R. 25,408) by A. J. Sabath, of Chicago, Ill., which for the first time attempts to provide a remedy for that which has heretofore been a flagrant disregard of all civilization. This compensation bill breaks with the theories of all previous attempts at palliative justice. It recognizes that all attempts at ameliorating conditions and affecting the administration of the law of master and servant are futile. This bill, if enacted, will do away with the necessity of an employe suing the corporation in a court of law and thus being subjected to all the ruinous delays and quibbles and distinctions by judges applying artificial rules of construction, themselves unnatural and perverted archaic theories of a nonexisting policy applied to modern industrial conditions. What originally may have been a mistaken view of what public policy calls for, has, after seventy years of ruinous and anti-social consequences to millions of English speaking workmen, become little less than a maze of unsettled and anti-social traps, pitfalls and snares to defeat just claims and to delay justice. Mr. Sabath's compensation bill is based on the theory that the employes of all mail and interstate carriers shall promptly be paid an annuity certain, based on the rate of their pay when they are injured in railroading. When they are killed their dependents, whether wife and children, or parents, are to receive an annuity based upon what the persons killed had earned at the time of their death. In order to put this system of compensation upon such a basis that the Supreme Court of the United States cannot in the last instance find an excuse for declaring the act unconstitutional, this bill proceeds upon the theory that the government of the United States may impose whatever conditions it chooses in its contracts with the carriers who may contract to haul the mail. This is not subject to the limitations of the Constitution in respect of regulations of interstate commerce.

The basis of this contract between the government and the mail carriers is that the carriers must assume the duty of paying for the persons killed or injured in their employ irrespective of any negligence of the employes. The pertinent parts of the bill are called the clauses of the federal compensation act, and these must be adopted as part consideration for the carriage of the mail by the carrier before the postmaster-general may pay or before the comptroller of the treasury may audit the payment of any charges for hauling the mail.

It has been found of great advantage to the carriers to have the letters U. S. M. (United States Mail) on their cars. These symbols insure to their passenger trains a protection as efficacious as a battalion of regulars.

The Revised Statutes protect the mail trains and forbid the unauthorized use of the symbols U. S. M. on any mail routes. By this bill the protection of the Revised Statutes is to be suspended in the case of any carrier that will not assume as part payment of the contract for the carriage of the mail the clauses of Mr. Sabath's compensation bill. In respect of those carriers who might not accept the clauses of the federal compensation act, and who would be willing to rely upon the indulgence of the community that they serve a suspension of these clauses would bring about a speedy and definite remedy, since the community they serve would, during the recalcitrancy of the carrier, go without their mail. It is conceivable that some carriers might prefer to rely on their common or general law rights of defeating recoveries by their employes, but the progressive railway companies would force the managers of these lines into accepting the clauses of the federal compensation act. Should this bill, or some bill embodying its principle, be enacted, the carriers would have a chance of recouping themselves for the extra payments that they may be required to make for the killed and injured by prompt and certain compensation, by charging the United States additional sums for the hauling of the mail than they have been receiving heretofore. Indirectly the losses of the killed and injured railroad men are sustained by the whole United States; in other words, the economic loss falls on the people who pay the taxes of the United States in the last instance. It is much more just that this loss be assumed and paid for by the government directly than that the entire loss should be borne by the persons injured. As was well said by Mr. Justice Moody in delivering the opinion of the Supreme Court in the Taylor case (210 U. S. 295): "Such an injury must be an irreparable misfortune to some one. If it must be borne entirely by him who suffers it, that is a hardship to him. If its burden is transferred so far as it is capable of transfer to the employer, it is a hardship to him. It is quite conceivable that Congress, contemplating the inevitable hardship of such injuries, and hoping to diminish the economic loss to the community resulting from them, should deem it wise to impose their burdens upon those who could measurably control their causes, instead of upon those who are, in the main, helpless in that regard. Such a policy would be intelligible, and, to say the least, not so unreasonable as to require us to doubt that it was intended and to seek some unnatural interpretation of common words." . . .

On this point President Roosevelt in his address at the Jamestown Exposition June 10, 1907, said: "For example, the great increase in mechanical and manufacturing operations means a corresponding increase of the number of accidents to the wage workers employed therein, these including both preventable and inevitable accidents. To the ordinary wage earner's family such a calamity means grim hardship. As the work is done for the employer, and therefore ultimately for the public, it is a bitter injustice that it should be the wage earner himself and his wife and children who bear the whole penalty. . . . But there should be additional legislation to secure pecuniary compensation to workmen suffering from accidents, and when they are killed, to their families. At present both in the sphere covered by national legislation and in the sphere covered by state legislation, the law in too many cases leaves a financial burden of industrial accidents to be borne by the injured workmen and their families; and a workman who suffers from an accident either has no case at all for redress or else must undertake a suit of damages against his employer. The present practice is based on the view announced nearly seventy years ago that 'principles of justice and good sense demand that a workman shall take upon himself all the ordinary risks of his occupation.' In my view, principles of justice and good sense demand the very reverse of this view, which experience has proved to be unsound and productive of widespread suffering." FROM A CONTRIBUUTOR.

February 13, 1909.

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Wisconsin Legislative Board.

Pursuant to the requirements of section 224 of the constitution the following brothers representing their respective lodges met in the city of Milwaukee, Wis., on December 29, 1908, for the purpose of organizing the Legislative Board of the Brotherhood of Locomotive Firemen and Enginemen for the State of Wisconsin: F. S. Godfrey, Lodge 425; A. R. McDonald, Lodge 534; George Barnaby, Lodge 259; W. Hathaway, Lodge 26; L. M. Maloney, Lodge 412; M. E. Ryan, Lodge 189; G. N. De Guire, Lodge 266; J. A. Bates, Lodge 385; A. S. Merz, Lodge 42; Chas. C. Buel, Lodge 130; J. M. O'Rourke, Lodge 388; W. M. Layland, Lodge 168; G. F. Spintler, Lodge 131; A. E. Griffith, Lodge 575.

The meeting was called to order by Grand Master John J. Hannahan, and the following officers were elected: Chairman, F. S. Godfrey; vice-chairman, A. S. Merz; secretary, G. N. De Guire; treasurer, W. Hathaway; executive board, M. E. Ryan, A. R. McDonald, Charles C. Buel; committee on by-laws, F. S. Godfrey, J. M. O'Rourke, W. M. Layland, A. S. Merz, G. N. De Guire.

Resolutions were adopted wishing Brother Hannahan success in his new field of activity. G. N. DE GUIRE.

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Indiana State Legislative Board.

In 1893 the members of Eureka Lodge 14 endeavored to have certain labor laws enacted by the state legislature that would be beneficial to the members of our Order. Their efforts were looked upon at the time as a joke. But those who have followed the work of the Indiana Legislative Board up to the present session know what can be accomplished if every member of our Order will only put his shoulder to the wheel and assist the members of the board in their efforts to ameliorate the condition of the wage earners of our State. It is true that for a number of years very little was accomplished, but the B. of L. F. and E., as well as all other labor organizations, have at last recognized the fact that they must use their political arm to gain their economic freedom.

It was certainly a source of much gratification to the writer to be present at the ninth session of the Indiana Legislative Board on January 4th and 5th of this year and to note the enthusiasm displayed by the members present.

The board was called to order at 10 a. m. by Brother Witty of Lodge 160, who acted on the instructions issued by Grand Master John J. Hannahan on December 3, 1908. The roll call of lodges showed the following representatives present: Henry Zink, Lodge 14; C. H. Todd, Lodge 16; W. E. Gordon, Lodge 162; R. Witty, Lodge 160; C. N. McCully, Lodge 203; P. L. Collins, Lodge 166; H. L. Williams, Lodge 685; F. W. Bichard, Lodge 447; H. E. Hawes, Lodge 297; John Casey, Lodge 36; H. E. Wildermuth, Lodge 52; D. S. Puett, Lodge 53; Jno. Doherty, Lodge 300; W. E. Trippeer, Lodge 157; J. R. Morrisey, Lodge 405; J. F. Ellis, Lodge 409; W. J. Coffman, Lodge 582; R. B. Blain, Lodge 457; E. C. Lough, Lodge 361; George W. Carmer, Lodge 141.

The following lodges were recorded as absent: Nos. 525, 613, 268, 459. The credentials committee reported all representatives with the proper credentials and they were seated.

The minutes of the last regular session, held January 8, 1907, were read and adopted. The secretary-treasurer of the board submitted his financial report, which was accepted and ordered to be placed on file. The election of officers and boards was called and the following officers were elected by acclamation: J. R. Morrisey, Lodge 405, chairman; P. L. Collins, Lodge 166, vice-chairman; W. E. Trippeer, Lodge 157, secretary-treasurer; R. Witty, Lodge 160; Jno. Doherty, Lodge 300; W. J. Coffman, Lodge 582, members of the executive board.

Top Row—D. S. Puett, 53 Henry Zink, 14 C. H. Todd, 16 W. E. Gordon, 162 G. W. Carmer, 141 R. S. Lowry, 525 R. B. Blain, 457 F. W. Bichard, 447

Middle Row—John Casey, 36 E. C. Lough, 361 H. E. Hawes, 297 C. N. McCully, 303 H. E. Wildermuth, 52

Bottom Row—H. L. Williams, 685 J. F. Ellis, 409 P. L. Collins, 166 J. R. Morrissey, 405 John F. McNamee, W. E. Trippeer, 157 Richard Witty, 160 John Doherty, 300 W. J. Coffman, 582
Ed. and Mgr. Magazine

INDIANA STATE LEGISLATIVE BOARD

Bro. John F. McNamee, Editor and Manager of the B. of L. F. and E. Magazine, on invitation of the board delivered a very interesting address on legislative matters, pointing out many obstacles that the laboring men had to surmount in order to secure legislation. Brother McNamee praised the B. of L. F. and E. for the progress it had made in legislative work, and expressed the hope that the various lodges throughout the State would become more and more interested in the legislative work of the Brotherhood. As Brother McNamee has been a legislator in the State of Ohio his address was of great value to the board. A vote of thanks was extended to him for his able address and advice. After adjournment Brother McNamee arranged a meeting with Governor-elect Marshall and the members of the board.

The time has arrived when the wage-earners of this country should select men from their own ranks to be their representatives in the halls of Congress and the state legislatures of our country. It is time we commenced to study our class interests and the necessity of class solidarity. It is absurd for a man to say that he can represent the interests of all classes in a community. The exploiter and the exploited have interests diametrically opposed to each other, and since the exploited are in the vast majority, they are, in theory at least, the sovereign. Our legislators profess to do everything by the authority of the people and in their name and for their welfare, and yet we know that the wage-earners of the country who are in the great majority are practically shut out from participation in the intellectual and material inheritance of our race. The spirit of liberty, fraternity and equality will some day, we hope, lead to a universal democracy. W. E. TRIPPEER.

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CO-EMPLOYE LAW HELD CONSTITUTIONAL BY SUPREME COURT OF WISCONSIN

One of the greatest victories ever gained by railroad employes in any state in the United States has been achieved through the decision handed down by the Supreme Court of this state (Wisconsin) January 5, 1909. Previous to 1903 there was no law upon the statute books of Wisconsin which would make a railroad company liable when one employe was injured through the carelessness of another. In those days the slaughter was tremendous, but has greatly diminished since the passage of the safety appliance act of 1902. Previous to the passage of the co-employe bill, passed April 21, 1893, and early in the session of the Wisconsin legislature, I sent a letter to all lodges in this state for a union meeting to be held at No. 4 Grand avenue, in this city, as there was no legislative board in this state at that time. So we managed to get twelve members out of all lodges represented, which was about forty-five, to secure the passage of a co-employe bill. I was one of the twelve. I then went to Illinois, where I secured a copy of the bill from William Burns, a member of the Illinois legislature, who was also a member of the Brotherhood of Locomotive Firemen. This bill was introduced at Madison, and when we were making considerable headway with its passage the rest of the members, composed of the B. of L. E., O. R. C. and the B. of L. F. and E., were told to go home or quit. They all went, and when they were gone I was told by the speaker of the Assembly that Mr. Whitcomb, general manager of the road on which I was employed, had told him I could either go home or quit. The bill passed. I was discharged for keeping up the fight. But that law still left contributory negligence a bar to recovery, and the courts sustained this doctrine so strongly that it was almost impossible to recover in a damage case. The fact was the injured party could not maintain an action for damages if he was guilty of the slightest want of ordinary care, no matter how great might have been the degree of negligence on the part of the railroad company unless the railroad company's negligence was so wanton and reckless that in case of death the agent, officer or employe of the railroad company who caused the injury could be indicted and convicted of manslaughter. The purpose of this bill was to change the law in this respect and to provide that in view of the hazards and risks incident to the dangerous business of railroading an injured and crippled employe, or his wife and children in case of his death, should not be defeated in an action against a railroad company where the injured or deceased employe in the performance of his duty was merely guilty of a slight want of ordinary care, while the defendant railroad company would be guilty of a greater degree of negligence or a greater want of ordinary care in protecting such employe. Under section 1 of this bill if any part of the machinery of a train breaks, the burden of proof is on the company to prove that there was no defect that could have been discovered. Previous to the passage of this act the burden of proof was on the employe, and that would almost always be impossible, for when any parts broke they were carried into the office of the train department, where they were locked up. Under section V of this bill all questions are for the jury. Previous to the passage of this act the judges would take the cause from the jury and dismiss. This law changes the rule. Certain railroads, to my knowledge, compel the person making application for employment to fill out an application blank, and in it is the following printed clause or paragraph:

"I agree that if while in the service of said company I sustain any personal injury for which I shall or may make claim against the company for damages, I will within sixty days after receiving such injury give notice in writing of such claim to the general claim agent of said company, which notice shall state the time, place, manner and cause of my being injured, and the nature and extent ot my injury."

Three states held this was bad law. Two states held that an employe had the right to make such a contract before entering the service. You will notice that section VI does away with this unfair dealing. I know the company did use that clause in that contract as a means to make cheap settlements whenever they failed to give such notice, which is usually the case.

The Supreme Court prior to the passage of section VII of this bill held that a logging road was not a railroad and did not come within chapter 220 of the laws of 1893 making railroad companies liable for the negligent act of a co-employe. But this law defines the question and makes all railroads liable except street railroad companies.

Section VIII provides that where any person or employe is hired in this state and is working in any other state, he can recover under the law of Wisconsin. Section IV of the bill provides that where the company's negligence was greater than that of the employe so injured or killed, he shall be entitled to recover. Now I have seen by the newspapers that there is a movement on foot to bring about cooperation between employer and employe in railroad service with a view to securing the enactment of legislation in the interests of the employer or in other words in the interests of the railroad companies. I have also learned that a railroad official was coming to Wisconsin to organize along such lines.

I hope the railroad employes will refrain from taking part in any such movement unless the railroad companies will assist them in the passage of good laws in the interest of the employe, which I am very much in doubt they will ever do. The trouble in the past has been that every time representatives of the railroad employes wanted to improve any law that would protect them and their families in case of their death the railway companies were there with their paid lobbyists and their money and the offer of good positions to the families of the lawmakers, especially some of the ex-senators and assemblymen who became lobbyists and classifiable in the very worst element of society, to defeat every measure introduced in the interest of railway employes when injured, and their families in case of their death. Now that some of the legislation is asked for in the interest of the general public the railway officials are asking their employes to assist them in defeating it. Where were those officials when this law referred to was under discussion before the legislature? They were there using every means in their power to defeat every section of this entire bill and did defeat it in 1905 by two votes.

This bill passed July 1, 1907, and it would not be on the statute books of this state today if it was not for the work of Robert M. LaFollette, who previous to 1905 read the roll call on all the stalwart senators in every town and hamlet in Wisconsin who voted against the bill. There were other good men who also contributed their support to the passage of this humane act. Among them was the Hon. Ervin L. Lenroot, now congressman, who was then speaker of the lower house; the Hon. W. A. Sanborn of Ashland, state senator; James A. Freer, now secretary of state and then a state senator; Herman L. Eckern, speaker when the bill passed and became a law; and the Hon. Harry Martin, state senator; the Hon. Thomas Morris of La Crosse, also state senator; Hon. W. C. Owen, state senator; the Hon. F. M. Wilcox of Appleton, Wis. Those and many others contributed to the splendid victory. I had this entire bill drawn by competent and able counsel, and while I am passing the half century mark have contributed some of the very best thoughts and efforts of my life in securing its passage, and in conclusion will say that from sixteen years' experience in this work it will be for the best interests of railway employes to select legislative representatives who are, first, honest, and next, able, and third, if possible to select men who are not in actual service for this work. As for my experience, no railroad man in this country could ever have held his position and secured the passage of this bill who had taken the active part in securing its enactment which I have had the honor to take.

I would like to add that during my efforts on behalf of the measure the attorneys representing the railroad companies treated me with the greatest respect. I refer to the attorneys who appeared before the committees in opposition to the bill. They were gentlemen of the very highest type. And their arguments were the most able arguments I ever heard. And I would suggest for the benefit of Legislative Boards in other states, that when they are going to employ attorneys, to frame laws in their interest, they should be careful whom they select, and if they employ attorneys who are as able and as faithful to their interests as those who appeared before the Wisconsin Legislature to the interest of the railway companies they will make no mistake and their laws will not be overturned by the courts. I call your attention to this for the reason that in reading the laws passed for railway employes in other states, contributory negligence is still a bar to recovery. That there is a clause which reads: "And where any such employe is so engaged in operating, running, riding upon, or switching passenger, freight, or other trains, engines or cars, and while engaged in the performance of his duty as such employe." This clause should be stricken out of every law passed in any of the states, as it prevents a recovery in a great many cases. I refer now to the "110 Wis. Reports, page 191," where the Supreme Court held that a conductor could not recover for injuries received through the negligence of a brakeman while unloading freight, even though the conductor was injured through no fault of his own.

The Law As It Now Stands.

The law as it now stands is as follows:

Every railroad company shall be liable for damages for all injuries, whether resulting in death or not, sustained by any of its employes, subject to the provisions hereinafter contained regarding contributory negligence on the part of the injured employes:

Roadbed and Machinery Defects.

1. When such injury is caused by a defect or insufficiency in any locomotive, engine, car, rail, track, roadbed, machinery or appliance used by its employes in and about the business of their employment.

Fellow Employes' Negligence.

2. When such injury shall have been sustained by any officer, agent, servant or employe of such company, while engaged in the line of his duty as such, and which such injury shall have been caused in whole or in greater part by the negligence of any other officer, agent, servant or employe of such company, in the discharge of, or by reason of failure to discharge his duties as such.

Court's Questions to Jury.

3. In every action to recover for such injury the court shall submit to the jury the following questions: First, whether the company, or any officer, agent, servant or employe other than the person injured was guilty of negligence directly contributing to the injury; second, if that question is answered in the affirmative, whether the person injured was guilty of any negligence directly con-

tributing to the injury; third, if that question is answered in the affirmative, whether the negligence of the party so injured was slighter or greater as a contributing cause to the injury than that of the company, or any officer, agent, servant or employe other than the person so injured; and such other questions as may be necessary.

Comparative Negligence.

4. In all cases where the jury shall find that the negligence of the company or any officer, agent, or employe of such company, was greater than the negligence of the employe so injured, and contributing in a greater degree to such injury than the plaintiff shall be entitled to recover, and the negligence, if any, of the employe so injured shall be no bar to such recovery.

Question for Jury.

5. In all cases under this act the question of negligence and contributory negligence shall be for the jury.

Contracts and Rules Subordinate.

6. No contract or receipt between any employe and a railroad company, no rule or regulation promulgated or adopted by such company, and no contract, rule or regulation in regard to any notice to be given by such employe shall exempt such corporation from the full liability imposed by this act.

"Railroad Company" Defined.

7. The phrase "railroad company" as used in this act, shall be taken to embrace any company, association, corporation or person managing, maintaining, operating, or in possession of a railroad in whole or in part within this State, whether as owner, contractor, lessee, mortgagee, trustee, assignee, or receiver.

Conflict of Laws.

8. In any action brought in the courts of this State by a resident thereof, or the representative of a deceased resident, to recover damages in accordance with this act, where the employe of any railroad company owning or operating a railroad extending into or through this State and into or through any other state or states, shall have received his injuries in any other state where such railroad is owned or operated, and the contract of employment shall have been made in this State, it shall not be competent for such railroad company to plead or prove the decisions or statutes of the state where such person shall have been injured as a defense to the action brought in this State.

Shop or Office Employes.

9. The provisions of this act shall not apply to employes working in shops or offices.

J. M. O'ROURKE.

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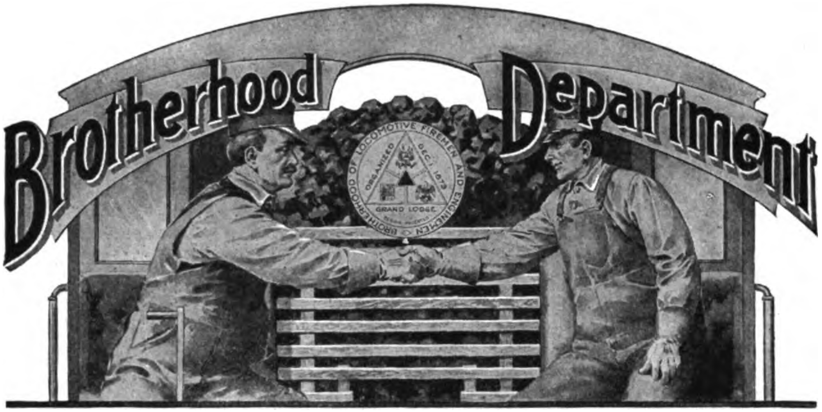

Annual Statement—Beneficiary Department.

In accordance with the laws of the State of Illinois requiring an annual report from all companies or societies doing an insurance business in that state, same to be published in the official publication of the organization within thirty days from date of filing with the insurance department, the annual statement of the Beneficiary Department of our Brotherhood for the year ending December 31, 1908, will be found elsewhere in this issue of the Magazine.

A careful reading of this statement cannot fail to be of deep interest to our membership, as it is a most concise and excellent report. By comparing same with the statement of a year ago it will be seen that while the present statement shows a slight decrease in the number of beneficiary certificates in force December 31, 1908, it shows a splendid increase in the balance on hand, as well as a considerable decrease in the liabilities (amounts due beneficiaries) of the Beneficiary Department on December 31, 1908.

The number of death claims paid during the year was 145 less than in the previous year, while the number of death claims unpaid December 31, 1908, was 23 less than on the same date the previous year. The number of disability claims paid during the year was 10 more than in the previous year, while the number of disability claims unpaid December 31, 1908, was but four more than on the same date the previous year.

The 1906 Mile Post on Front Cover of Magazine.

Many brothers have written to the Magazine office requesting an explanation of the 1906 mile post in our front cover design. For their information we would say that same is used to represent the year in which the very important action was taken of changing the name of our Order from that of the Brotherhood of Locomotive Firemen to Brotherhood of Locomotive Firemen and Enginemen.

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To the Editor.

Shandy Pays His Respects to the Editor.

Replies to poetic reference to his retirement (page 273 of the February issue) and feelingly recalls some of the joys of his life as a roundhouse foreman.

Now, my dear McNamee, I am sorry to read
All the nice things you've said. You're a blarneyin' rogue
That can deal out your praises without any greed,
Polished up for your readers in choicest of brogue.
You decry the tough job which I've toiled at so long;
Take my word for it, John, I ne'er smothered in mirth,
No nor lightened my labors with snatches of song,
For my life was most surely a hell upon earth.

All my very best years I have stayed
on the job,
At the mid of the night, just the same
as the day;
From my breast I sent skyward full
many a sob,
Asking Jove if He'd call me to rest in
the clay;
'Till at length when my nerves were all
dancing a jig,
And my brain ever humming a devil's
tattoo,
And my voice just as hoarse as the grunt
of a pig,
I at last pitched it up, and, old friend,
wouldn't you?

Oh, the days of lang syne when I sat in
the cab
Of a fancy "McQueen" singing songs
for the boys!
When I, too, like yourself, had a mouthful of gab,
And a tongue ever ready to tell of our
joys;
But they're gone to the graveyard of
many a hope,
And old hogs in their places now lie
down and die;
All connections ground off for the want
of some dope,
And our left-handed prayers strung
from earth to the sky.

When the robins get back to this place
where I write,
I'll be off, with God's help, and a favoring gale;
And, dear John, I will caper the decks
with delight,
As we steer by the long wished for
Head of Kinsale!
At Old Cove how I'll sing as we enter
the bay!
And perhaps I may shed a few heartrending tears—
Since I last saw the land it is many a
day,
Oh, my Lord, can it be? Yes, it's sixty long years!

There are leprechauns* there that have
crocks full of gold;
I'll go hunting some night, and perhaps
I'll catch two;
If the ranting young rascals I only can
hold,
I'll keep one for myself and give t'other
to you;
And it's then, my old friend, we'll have
ship loads of wealth.
Little fairies, skies bless 'em—"the
good people," † Jack.
If they only can aid me to gain my lost
health,
We'll sing joyous "Come all ye's" each
month when I'm back.

SHANDY MAGUIRE.

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*In Irish folk-lore the leprechaun is shoemaker for the fairies. Wherever a leprechaun is seen there is supposed to be a crock of gold in the immediate vicinity. The leprechaun is of course a fairy himself.

†In Irish folk-lore the fairies are sometimes referred to as "the good people."

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Sparks.

We would like to procure a bound volume of the Magazine for the year 1886, and would request that parties in possession of a copy of this volume of which they are willing to dispose, please correspond with John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Brother R. A. Wiseley has a complete file of the Magazine for the years 1907 and 1908, with the exception of the April, 1907, number, and the March and June numbers for 1908. Anyone interested should corresponnd with R. A. Wiseley, Box 263, Coulterville, Ill.

Do you know that an organization to be effective must be complete?

Communications of all kinds, whether for publication or otherwise, must be signed by the sender, not necessarily for publication, but as evidence of good faith on the part of the writer. If they are not so signed they cannot be published.

Bro. James P. Walsh, President of Lodge 577, has copies of the Magazine from January, 1907, to December, 1908, which he states any member can secure by sending postage to him. His address is James P. Walsh, 5119 S. May street, Chicago, Ill.

Do you know that you are carrying the burden of the non B. of L. F. and E. man's protection and improved working conditions?

Information of special value to the energetic railroad man is found in the Catechism of the Electric Headlight, which sells for 50 cents, and which can be procured by sending that amount to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

"Nothing succeeds like success." You cannot start in too soon with the work of getting into our ranks every man who is eligible to join our Brotherhood. The first new member you succeed in influencing to join your lodge inspires you with determination to keep the good work going. Remember our slogan is 90,000 for St. Paul.

See that the non-Brotherhood man bears the burden of his own protection by joining the Order.

Mr. H. A. Spalding, of Two Harbors, Minn., reports to the Magazine office that he has back numbers of the Magazine for the years 1901, 1902, 1903, 1904 and 1905, of which he is willing to dispose. Some of the years are not complete. Interested parties can correspond with him direct at the above address.

Now is the time to start to get 90,000 for St. Paul.

Bro. M. L. Houlihan, Secretary Lodge 477, in a letter to the Magazine office, among other things mentions the fact that College City Lodge is getting along splendidly. They are constantly adding new members and he states if they continue to add them at the rate at which they have, their membership will soon reach the 300 mark.

The last Convention adjourned with the determination of organizing all the unorganized firemen and keeping all of our engineers. Every brother should devote his best effort to the carrying out of that great purpose.

If you desire to be thoroughly posted on the modern headlight you should send 50 cents to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind., and secure a copy of the Catechism of the Electric Headlight.

Do you know that there are thousands of non-Brotherhood men in the country and that if you, in conjunction with other Brotherhood men, will do your share of the work the greater part will soon be members of the Order?

Fifteen cents sent to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind., will secure one of our charts on the new No. 6 ET Locomotive Brake Equipment, together with printed matter descriptive of same.

By doing your share of the work of organizing means getting all non-Brotherhood men who are eligible to membership and whom you can influence, to join the Order.

We still have on hand a few bound volumes of the B. of L. F. and E. Magazine for 1907, a copy of which will be sent prepaid upon receipt of $2.50. Address John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

See that each fireman bears his own proportionate cost of working for and maintaining improved conditions.

Instruction Diagram of Piping Connections of the No. 6 ET Locomotive Brake Equipment, together with printed descriptive matter, will be sent to any address upon receipt of 15 cents. This diagram is of great value to any railroad man who is interested in becoming thoroughly familiar with everything that is modern in the air brake field. Send your remittance to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

See that each pays for the benefits he is enjoying by becoming a member of the Brotherhood.

Upon changing your residence let it be one of your first duties to drop the Editor a postal card advising him of same. Failure to do this not only causes you to lose your Magazine for one or two issues, thus breaking your file, but places the Editor and Manager in a position where he cannot carry out the work of furnishing each and every member with a copy of our official publication regularly.

The Locomotive Fireman.

'Neath the glaring blaze of the midsummer sun, at the furnace door he stands,
While the fiery rays beat on his head and his strong brown sinewy hands.
The leaping flames seem filled with hate, as they devour the coal,
'Twould seem as though they covet e'en the toiling fireman's soul.
A searching eye on the gauge he keeps, and he works with untiring zeal,
As onward and on to her goal she sweeps, this creature of steam and steel.
The furnace heat is pitiless and the sun's both fierce and grim,
But the fireman must endure them both for *all* depends on him.
When the terminal is reached at last, at the end of the per'lous run,
'Tis only then his danger's past and his toil for a few hours done.

'Neath the gloomy gray of the winter sky, the fireman toils apace,
And all the day the snowflakes fly in a dense and maddening race,
Stinging and sharp as a dagger-thrust is the biting frost so keen
When Winter scolds in a howling blast and on mortals vents his spleen.
The fireman feels the bitter cold and the fireman's face grows stern,
For to ills like these he must not yield, nor from his labor turn.
He must give no heed to frost and snow, or to lightning flash and rain;
Weary though his limbs may grow, weary his heart and brain,
And all the dangers of the rail in ambush lurk for him;
He must not fall and he must not fail—he must work in silence grim.
For not 'till he's at home once more and near his fireside warm
Is freedom his from strife and care with steam and steel and storm.

In dollars and cents we estimate the worth of the fireman's toil;
The effort he puts forth is great, yet small is his share of the spoil.
In dollars and cents is the fireman paid, and of praise he asks no word,
Of his hardships great nothing is said, of his courage naught is heard.
For the sake of those he so much loves to the great world that demands
His toil the best he eager gives of both his brain and hands.
Let's hope that on the judgment day, when reckoning he makes
Of all his acts and thoughts and sins, of all of his mistakes,
That 'gainst them all may heavy weigh his trials on the rail,
Salvation to insure him may they then in full avail.

LYDIA M. DUNHAM.

* * *

Called Out.

Called out! that old familiar sound
Is ringing in my ears.
Its terrors have not vanished
With the passing of the years;

And even now I sometimes feel
That nameless sense of dread
That used to haunt my waking hours,
And follow me to bed.

The call boy seemed to think my door
Intended for a drum;
And every dark and stormy night
That imp was sure to come.

And he was pleased, I know he was,
To hear me rise and—well,
Just what I thought and what I said
I hadn't better tell.

For it would not look good in print,
And, too, I wouldn't care
To have to feel that I had taught
Some "railroad man" to swear.

But then, you know, there's some excuse
For feeling rather blue;
It seems to get right on your nerves
And stir you up clear through.

And good St. Peter never would
Admit to heaven's joys,
A soul that called him to the gate
With such unearthly noise.

C. P. HUBLER.

FROM THE PRESIDENT

The Dangers of Dissensions.

Without detracting from the military glories of Caesar or Napoleon, one is led to believe that much of their success may be attributed to the dissensions of their opponents in war.

It was a favorite practice of Rome to encourage disputes and antagonisms between the provinces that she had already subjected. Often the soldiers of one suffering province were used by the Romans to suppress insurrection in another. By this policy the provinces were taught to hate each other—and Rome levied tribute on them all.

France profited in like manner from dissensions among the commanding officers of the "allies," and on more than one occasion routed the army of one country while its officers were disputing with the officers of other armies as to the best plan of campaign.

An observer of industrial conditions would probably reach the conclusion that railway officials are more familiar with history and strategy than are the members of railway labor organizations.

It should be evident to every member of all the brotherhoods that dissensions are costing them equitable settlements of wage matters and adjustments of personal grievances.

Let us hope that these dissensions do not result in something worse.

A Word to Non-Union Firemen.

The reports of the Interstate Commerce Commission show that the loss of life and limb by railway employes is almost as great as in actual warfare.

The last report of the commission published shows that during the one year ending June 30, 1907, there were 4,353 railway employes killed and 62,689 railway employes injured.

During the same year it is shown that 73 men were killed and 144 injured from boiler explosions alone. Derailments and collisions killed 776 and injured 6,273.

In fact, every time a man goes out on his engine he assumes almost as much risk as a soldier does in line of battle.

In addition to deaths and injuries from railroad accidents, the exposures and privations incidental to an engineman's life results in a high death rate from diseases. These mortality statistics have alarmed the insurance companies and associations so that men in railway train service find it almost impossible to secure life insurance at any price, and the so-called accident insurance is procured only at a high rate.

To meet this alarming situation the Brotherhood of Locomotive Firemen and Enginemen conducts a beneficiary department for the special purpose of furnishing a perfect life and disability insurance to locomotive firemen and enginemen at a rate much cheaper than the same benefits can be secured from any or all other sources on earth.

If you are not already physically disqualified, a membership in the Brotherhood of Locomotive Firemen and Enginemen secures to you and to those dependent upon you insurance benefits that cannot be secured anywhere else.

This Brotherhood issues to members beneficiary certificates in amounts of $500, $1,000, $1,500, $2,000 and $3,000. The full amount of the beneficiary certificate held by a member is payable to himself should he become totally and permanently disabled from the performance of manual labor from any of the following causes:

Bright's disease of the kidneys.

Permanent paralysis of either extremity.

Locomotor ataxia.

Consumption of the lungs in its last stages.

In addition to the foregoing the full amount of the beneficiary certificate is payable to the member himself should he lose a hand or foot at or above the wrist joint, or if he should become totally blind in one or both eyes. No other institution pays the full amount of insurance to the member himself for so many forms of disability, and no man in locomotive engine service can afford to be without this protection.

As great as are the disability benefits paid by the Brotherhood of Locomotive Firemen and Enginemen the death benefits or "life insurance" are of far greater magnitude.

Thousands of widows and orphans and aged parents can testify to the beneficent work of this Brotherhood. During the last five fiscal years more than four millions of dollars have been dispensed by this Brotherhood in death and disability benefits. The records of the organization show the following amounts:

Fiscal year.	*Amount paid in benefits.*
1904	$808,450.00
1905	810,250.00
1906	851,350.00
1907	947,100.00
1908	852,129.17
Total for five years	$4,369,279.17

Railroad men deserve their reputation for bravery in facing the dangers that beset them on every side, but are they not also thoughtless and negligent of themselves and neglectful of those who depend upon them for support when they fail to provide against unexpected disability or death?

Sixty-six thousand locomotive firemen and enginemen have protected themselves and their loved ones against the poverty that goes with physical disability and death, by uniting for their mutual support in the Brotherhood of Locomotive Firemen and Enginemen. Are you so thoughtless of your own welfare—so negligent of those whom you love and who love you, and who depend upon you for the necessaries of life—so thoughtless and negligent as to work another day on a locomotive without seeking to secure the insurance protection that the Brotherhood of Locomotive Firemen and Enginemen is ready to extend to you?

Deaths from Boiler Explosions.

From July, 1907, to June, 1908, the reports of the Interstate Commerce Commission show the following deaths and injuries to railway employes as results of locomotive boiler explosions:

	Killed.	*Injured.*	*Total.*
Enginemen	17	16	33
Firemen	14	11	25
Trainmen	11	21	32
Other employes	3	12	15
Total	45	60	105

This estimate is based upon the reports made to the commission by railway companies.

During the calendar year of 1907 the Brotherhood of Locomotive Firemen and Enginemen paid death claims of 24 members whose deaths resulted from boiler explosions and one death from "bursted arch bar," making 25 deaths in all.

Answering Questions and Interpreting Laws.

Section 20 of the new constitution provides that among the duties assigned to the President of the Brotherhood is to "promptly decide all questions and appeals submitted to him by Joint Protective Boards, subordinate lodges or members."

Section 94 provides that "should any doubt arise as to the proper construction of any section or rule thereof (of the constitution) it shall be referred to the International President, whose decision shall be final unless modified or reversed by the Board of Directors or the ensuing convention."

Since the first of the present year so many questions and interpretations of the laws of the Brotherhood have been asked that it has been impossible for the President to "promptly" answer same. The volume of correspondence in regard to questions and interpretations would take up almost the entire time of the President, to the exclusion of all other business.

The constitution does not contemplate that the President shall interfere in disputes that may arise between members or between members and Joint Protective Boards, or between members and Legislative Boards, until such time as these disputes are passed upon by the lodges and boards as directed by our laws. Many of the questions asked should not be answered by the President, because of the fact that his answers would be used by one disputant against another before the lodge or board had opportunity to pass upon the matters. Any opinion expressed by the President in such matters would necessarily be based upon ex parte statements.

After lodges and boards have passed upon disputes or misunderstandings, any member or lodge is entitled to appeal to the President against any decision. The President after an impartial investigation will approve or reverse the action of the lodge or board. The decision of the President may be appealed from to the board of directors, and their decision may be appealed from to the next convention of the Brotherhood; therefore it will be understood that the President will not, by answering questions or rendering opinions, displace lodges or boards in the judicial authority clearly assigned such lodges or boards by the laws of the Brotherhood.

When members are aggrieved or displeased, they should first take up such matters with their lodges or boards, as directed by our laws upon the subject, and if not content to abide by the decision of the lodge or board, then appeal to the President in the manner directed by the constitution.

* * * * *

FROM THE GENERAL SECRETARY AND TREASURER

Amount of Assessments Due from Members.

Many inquiries are being received at this office as to just how much each member should pay at the beginning of the monthly payment of assessments.

For the benefit of officers as well as members, I will try and make it plain just what should be paid to the financial secretary by each and every member.

It should also be borne in mind that this amount must be paid on or before the first day of the month or the member is expelled. No action on the part of anyone is necessary to expel a member for nonpayment of assessments. The simple fact that a member fails to pay the financial secretary expels said member; and the financial secretary should at once make report to the General Secretary and Treasurer of all members who fail to pay.

Double Beneficiary Assessment.

The action of the last Convention provided that every beneficiary member should pay a double beneficiary assessment on or before April 1, 1909. In connection with this each member will be required to pay 25 cents General Fund assessment as well as local lodge assessments, which shall be in such an amount as may be decided by the lodge; provided that in no case can it be less than 25 cents per month. Many Joint Protective Boards have decided to collect assessments monthly. All members in engine service under the jurisdiction of such boards will be required to pay said Joint Protective Board assessments at the same time they pay their other assessments.

The following table shows what each member should pay on or before April 1st, in order to pay the double beneficiary assessment referred to.

Beneficiary Assessments.		*General Fund Assessments.*
Class A members, $1,500	$3 30	$0 25
Class B members, 1,000	2 20	25
Class C members, 500	1 10	25
Class D members, 2,000	4 40	25
Class E members, 3,000	6 60	25

In addition to the above, local lodge assessments and Joint Protective Board assessments must also be paid (if the lodge is located on a railway system whose Joint Protective Board has decided to collect monthly) in such amounts as have been decided upon by the local lodge and Joint Protective Board.

It is to be understood that the double assessment is only for one month, and on or before the first day of each month thereafter the amount of assessments for each member will be as follows:

Beneficiary Assessments.		*General Fund Assessments.*
Class A members, $1,500	$1 65	$0 25
Class B members, 1,000	1 10	25
Class C members, 500	55	25
Class D members, 2,000	2 20	25
Class E members, 3,000	3 30	25

and in addition thereto local lodge assessments and Joint Protective Board assessments, the same as referred to above.

Paying Assessments for a Longer Period Than One Month.

Many inquiries have also been received asking if members can pay assessments for a longer period than one month. To all such inquiries I have replied that a member can pay as many assessments in advance as he desires. The financial secretary can receipt for the same and turn it over to the treasurer. In this connection I may add that the treasurer must at all times keep this money intact, as said money belongs to the Grand Lodge and cannot be used for any other purpose than to pay the assessments of the members who paid it to him.

Increase in Amount of Beneficiary Assessments.

Letters are being received making inquiry why the amount of beneficiary assessments and General Fund assessments have been increased, and in some instances inquiry is made as to why the assessments on Classes "D" and "E" certificates were reduced when the Classes "A," "B" and "C" were raised. The following will show in detail matters in regard to amounts of assessments:

At the Tenth Biennial Convention held in Milwaukee, Wisconsin, in 1906, it was shown by the report of the Grand Secretary and Treasurer that the losses on Classes "D" and "E" certificates in two years were as follows:

Class "D" certificates.......	$9,252 25
Class "E" certificates.......	30,055 25
Total	$39,307 50

For this two years the assessments on these classes of certificates were:

Class "D," per quarter..........	$6 00
Class "E," per quarter..........	9 00

The recommendation of the Committee on Constitution and By-Laws was adopted and the assessments were made as follows to begin January 1, 1907:

Class "D," per quarter..........	$8 00
Class "E," per quarter..........	12 00

You will see by this that the assessments on these two classes were raised, as follows:

Class "D," per quarter..........	$2 00
Class "E," per quarter..........	3 00

During the two fiscal years ending June 30, 1908, the following is the report on these two classes:

Class "E," gain............	$19,770 50
Class "D," loss.............	5,010 50
Gain on the two classes...	$14,760 00

It will be seen by this that taking the two classes together there was an actual gain of $14,760.00. In view of the fact that it was apparent these two classes were now self-sustaining it was thought best to put all classes on an equal basis of $1.10 on assessments per one thousand dollars. Even with the decrease in amount of assessments on these two classes of certificate, yet the Class "D" costs 60 cents, and Class "E" 90 cents per quarter more than during the 18 months ending June 30, 1906. Four per cent. of the amount collected goes into the Beneficiary Expense Fund and six per cent. into the Reserve Beneficiary Fund.

The increase in Classes "A," "B" and "C" amounts to but 10 per cent. on each class.

Prior to March 1st there was levied by the Grand Lodge two assessments in each quarter, as follows:

Class "A," two assessments at $2.25 each	$4 50
Class "B," two assessments at $1.50 each	3 00
Class "C," two assessments at 75 cents each	1 50

Under the new law there will be collected one assessment each month, or three in three months, as follows:

Class "A," three assessments at $1.65 each	$4 95
Class "B," three assessments at $1.10 each	3 30
Class "C," three assessments at 55 cents each..............	1 65

Under the laws of the State of Illinois, in which State our headquarters are located, it is necessary for the Grand Lodge to designate that a certain per cent. of collections made in the Beneficiary Department be set aside to defray the expense of said department.

Heretofore the expense of maintaining headquarters has been prorated between the General and Beneficiary Funds and said amounts for the Beneficiary Fund were taken from funds raised on account of levying beneficiary assessments. It was not thought wise to set aside certain percentages of the amounts which were formerly collected, and in that way reduce the amount in the Beneficiary Fund; but on the contrary it was thought best to increase the assessment four per cent. to meet the condition.

Reserve Beneficiary Fund.

It has been seen for some years by Grand Lodge officers that the organization should have an Emergency Beneficiary Fund, in order that we could meet any unusual demand on said fund. This matter was explained to the delegates and they very wisely provided for a Reserve Beneficiary Fund. Not wanting to make a separate collection for this fund they provided that it should be collected at the same time as other assessments, and so made it a part of the regular beneficiary assessments. To raise this fund it was decided to set aside six per cent. of all beneficiary assessments collected, the same to be deposited in the Reserve Beneficiary Fund.

It will be seen by the foregoing that there has been an actual increase of but four per cent. in beneficiary assessments; and this was necessary to meet the insurance laws of the State of Illinois. The other six per cent. is for an entirely new fund. The wisdom of having created this new "Reserve Beneficiary Fund" will be seen in time.

Joint Protective Board Assessments.

As many Joint Protective Boards have decided to collect assessments monthly, treasurers of subordinate lodges may feel that they can make remittances to the Grand Lodge at the same time and with the same draft or money order as they do General and Beneficiary remittances. This must not be done, as the Joint Protective Board account is kept in a different bank from the other funds.

Remittances for Joint Protective Board assessments must be sent in separately, for when they are remitted with other assessments it becomes necessary to have the draft or money order cashed and the money divided so as to deposit in the proper funds.

Joint Protective Board Monthly Assessments.

If any Joint Protective Board that provides for monthly assessments will advise this office we will forward blanks for six months which can be filled out by the general chairman and secretary and treasurer of the board and returned to this office. We will place them on file each month or several months in advance in order to comply with Section 215 of the Constitution.

Murphy Monument Fund.

Receilved by A. H. Hawley, General Secretary and Treasurer, from January 12, to and including February 12, 1909:

The following lodges have remitted $1.50 each: 4, 24, 28, 36, 39, 40, 43, 48, 56, 64, 100, 106, 107, 117, 127, 133, 134, 157, 159, 170, 177, 183, 192, 204, 216, 221, 229, 232, 235, 241, 254, 258, 267, 271, 275, 286, 289, 302, 318, 324, 341, 350, 358, 368, 386, 390, 399, 413, 428, 436, 441, 444, 445, 446, 454, 460, 461, 466, 469, 471, 493, 495, 510, 511, 534, 535, 539, 551, 552, 586, 590, 592, 593, 596, 600, 601, 606, 608, 610, 617, 630, 644, 646, 663, 692, 701, 703, 729, 741, 746, 747, 750	$138 00
Lodge 85	1 75
Lodge 94	5 00
Lodge 121	2 00
Lodge 149	26 50
Lodge 178	5 00
Lodge 291	2 00
Lodge 697	5 00
W. W. Young, Lodge 312	2 00
Total for month	$187 25
Previously reported	475 45
Total receipts to date	$662 70

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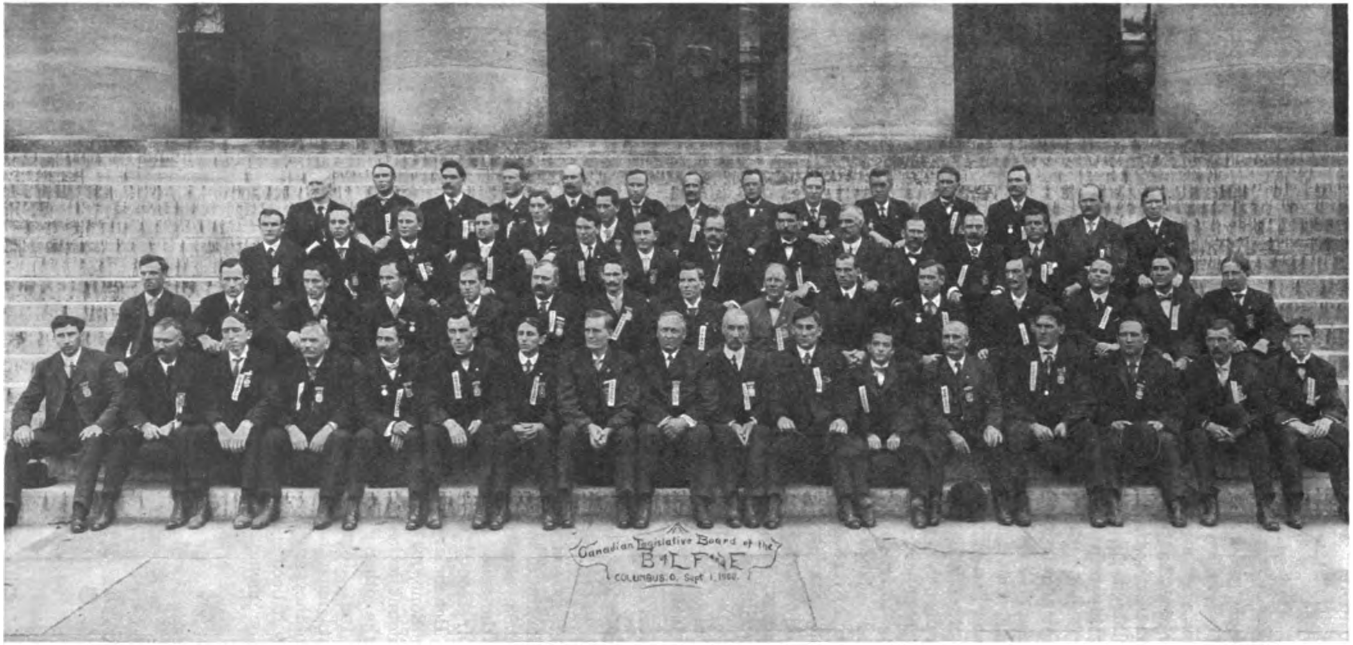
Canadian Legislative Board of the
B of L F and E
COLUMBUS, O. Sept 1, 1908.

CANADIAN DELEGATION, ELEVENTH BIENNIAL CONVENTION (COLUMBUS, OHIO), CONSTITUTING ALSO CANADIAN LEGISLATIVE BOARD

In the center are Brother Albert Fox, General Secretary of The Associated Society of Locomotive Engineers and Firemen of Great Britain, and Brothers E. A. Ball, Second Vice-President, and George K. Wark, member of the Board of Directors, B. of L. F. and E.

Forum

Union Meeting.

On Sunday, January 31st last, at five o'clock, a union meeting was held at Philadelphia, Pa., under the auspices of Lodges 60, 72, 75, 253, 319 and 333, which proved a great success. Two secret sessions were held, several hundred brothers attending. The meeting was opened with prayer by our grand chaplain, Brother Leahy. We had the pleasure of having our Third Vice-President, Bro. A. P. Kelly, with us, and his address was profitable and well delivered, being appreciated by all who were fortunate enough to be present, among whom were the officers of the Pennsylvania R. R. Joint Protective Board East and the Philadelphia and Reading Joint Protective Board.

When Chairman Lynch opened nominations for the holding of our next fifth Sunday meeting Brother Maust, of Pittsburg, placed in nomination the city of Pittsburg. Brother Feldmeyer placed in nomination the city of Baltimore, backed by his little band of twelve braves. Baltimore, on account of its excellent facilities, as well as the humorous remarks of Brother Feldmeyer, was finally decided upon. The Baltimoreans promise all a good time when we assemble in their city on the fifth Sunday in May next.

Brothers, support these meetings, encourage them by your presence and gain therefrom knowledge that will be a great benefit to all.

In closing will again say remember the next union meeting in Baltimore, Md., on May 30, 1909.

E. E.

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Lodge Seal on Receipts.

In a reply from Past Grand Master Hannahan about lodge seal appearing on all lodge receipts for dues and all other monies paid to local lodges, I received his final decision on this subject, in which he informs me that it is not required and necessary on receipts except where receipt has the order for the secret work attached. Brothers, it is quite an easy matter for an impostor to obtain a blank receipt, fill it out and obtain favors from brothers who have paid, legally, their dues. I would like very much if our members would take this matter under careful consideration with a view to having a law enacted requiring the impression of the seal on all receipts issued to us by our local lodges. This should be done for several good reasons, probably the most important of which is that it will to a great extent put a stop to a considerable amount of fraud being practiced on our members by impostors. We would like to hear from other brothers on this subject. Let us see if we cannot provide for a more strongly official receipt—one that will preclude the possibility of fraud. This is more important than it may seem to some of us at a first glance. I trust this may be brought up in lodge meetings and discussed and put through on its merit, looking to definite action on the question by our next convention.

D. A. GRIMSLEY,
Member Lodge 261.

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Sick and Accident Benefits.

Several propositions that came before the late convention of our Brotherhood seem to indicate a desire on the part of our members to institute a sick and accident benefit department. The idea of providing a fund in time of health to help in time of sickness is commendable, and should be encouraged and practiced more than it is. At the same time, when it is proposed to make it a national or indeed an international association it must be approached with due caution and consideration for its inception, its life and its perpetuity. No one would like to enter an association of any kind without a prospect of its life being reasonably sure.

The first question that will arise is: who will create this fund? The answer is the *members of the association.* Please bear in mind the fact that "the members must create the fund," for there is no other means of income, and that the amount needed must be met by adequate payments to be made at regular times by its members.

What are adequate payments? will be asked. That of course depends upon the rate of benefits paid and the amount of sickness among the members, if the assessment plan is used and only enough collected to meet the expenses for the present time. This "*hand to mouth*" way of living is not to be admired, and is not followed to any extent.

"B. I. W." in the January Magazine thinks that benefits amounting to about three-fourths of his wages would about suit his ideas, but as he does not say what his wages are he has us guessing. Suppose $72 per month, or $18 per week, to be the sum that B. I. W. would like to have to fall back on. This would be a good average income, and would perhaps pay the family expenses if not too large or extravagant. We will now go on to consider the cost to the members who, while they are to receive *certain benefits* under *certain circumstances*, are to furnish all the money used *under any circumstances*. It is a somewhat obscure matter to calculate on the health of a number of men, but sick benefit societies are not a new or an untried scheme, and some light may be had from the past history of these societies.

About twenty years ago the Grand Lodge of the I. O. O. F. of the State of Pennsylvania found that something was wrong with the general plan of sick benefits of that order and appointed a committee to investigate and report. There were over 900 lodges in that state at that time, and this fact gives value to the report, as it gives the result in a large number of societies scattered over a populous state. The old lodges were, with hardly an exception, bankrupt; some of the next oldest were in better condition; some still younger had money on hand; some of still later date had plenty of funds, while the youngest lodges were apparently getting rich fast. The committee had a year in which to investigate, and came to the conclusion that the fault lay in the fact that the lodges paid more in sick benefits than the amount for dues warranted, and that while new lodges with a young membership would apparently prosper and lay up money, in time, with age creeping on the membership, sickness increased until any further increase in funds stopped, and finally even the former surplus was drawn into and at last used up. As a rule the lodges charged about 10 cents a week and paid about $5 or $6 a week benefits. The committee said that the rate charged was not adequate, and that no lodge ought to promise to pay more than one-half as much weekly sick benefits as the yearly dues were, or if the yearly dues were $5.20 the lodge should not pay more than $2.60 per week sick benefits.

We had a sick benefit association among the employes of an Eastern road which took in all employes in any capacity, and thus the membership was quite numerous. The members paid 50 cents per month and received $1 per day when sick. The association kept alive for about twenty years, but would not have survived so long had it not been for the excursions gotten up by it every summer, run at the railroad company's expense, and for the balls held each winter, for which the patrons of the road paid. Five or six hundred dollars a year was thus added to the dues of the members, and still it did not perpetuate itself.

We need not go outside of our own Order to find lodges that have tried the scheme, and after running a while with greater or less success have given it up as a "bad job" because they ran out of funds. But some of the advocates of the scheme will say "in union there is strength," and if we have a large number of members we will be all right. In the matter of sickness or death there is no greater safety in numbers, as sickness will increase in proportion with the number, for there will be ten times as much sickness in a membership of 1,000 as there would be in a membership of 100, or ten times as much among 10,000 as there would be among 1,000 members.

If we apply the lessons to be drawn from the above precedents we find that to be safe and on a probably enduring basis of life an association paying $72 per month or $18 per week ought to charge $3 per month for dues; if the benefits are $12 per week the dues ought to be $2 per month; if the benefits are $6 per week the dues ought to be $1 per month. Do these figures seem high? Remember that others started with lower rates, but where are they now? Do rash promises based on empty treasuries constitute the protection you want if sickness should be your lot? A good article ever costs in proportion to its value, while a cheap article may be dear at any price.

The law as proposed by Lodge 100 seems to provide for a sick and accident fund to be raised by assessment as needed. This is generally found to work very well at the start, but in order to get "ahead" of some "rounders" it is necessary to insert a clause stipulating that no benefits can be drawn the first six months or year. Then when you get a large number of members into an order under low assessments there is ever serious complaint on their part when the assessments become heavier, and that time is as sure to come as anything in the world.

(1) Wm. Johannbroer, Chairman B. of L. F. & E. (2) Sam Simpson, Chairman G. C. of A., B. of L. E. (3) J. W. Schlem, Secretary G. G. C., B. of R. T. (4) F. Street, Vice-Chairman B. of L. F. & E. (5) J. F. Reilly, Chairman G. C. A., O. R. C. (6) Asa Dillon, Fourth Vice-President B. of L. F. & E. (7) H. E. Wills, A. G. C., B. of L. E. (8) L. E. Sheppard, First Vice-President O. R. C. (9) A. F. Whitney, V. G. M,, B. of R. T. (10) J. B. Jenks, Secretary G. C. A., O. R. C. (11) L. F. Shaug, Chariman G. G. C., B. of R. T.

FEDERATED BOARD, COLORADO AND SOUTHERN RAILWAY

There are, therefore, two ways of starting a sick benefit association; one on the current idea and one on the provident plan. By the current idea, I mean a plan that provides for raising the funds by assessments as fast as wanted. Of course, at the start these assessments will be light, but unless the members are forewarned they will expect these light assessments to continue, and will "kick" if they by stress are increased. If the membership of the society is told that in time the assessments will become higher—and they join with that understanding—then there is no wrong done and no "kick" is due.

The other way is to provide ahead for the natural increase of expenses by paying more than needed into the treasury, the surplus and its interest forming a fund which could be used to lighten the increasing assessments. This is what is required by law of all insurance companies, that is, the formation of reserve funds.

Personally I am one of the "unfortunate ones," for while I have belonged to sick benefit societies for years at a time I have never been sick long enough to draw benefits, and I have also been insured and have not yet quit this mortal sphere. W. W.

* * *

That the True Facts May Be Known.

In the General Secretary and Treasurer's Department of the January issue, under the subhead "Attempted Impositions on the Brotherhood" (page 128), details are given of an attempt by a member of Old Kentuck Lodge 584, to defraud the Grand Lodge by undertaking to have his insurance collected under the pretense of having committed suicide.

As I was secretary of Old Kentuck Lodge at the time referred to, I feel that as a matter of justice to myself the following facts in the case should be made known to the readers of the Magazine. On January 3, 1907, I received a letter from the wife of R. P. Shadoan, who was at that time a member of Old Kentuck Lodge 584. The letter stated that he (R. P. Shadoan) had committed suicide by jumping from the Grand Island bridge at St. Joseph, Mo., on May 30, 1907. The report of suicide was based upon the finding of a hat and a letter which were found lying on the bridge. I also received some newspaper clippings from the News and Press of St. Joseph, Mo. The newspaper clippings, in addition to an explanatory letter written by me, were forwarded to the Grand Secretary and Treasurer. Permit me here to say that there was no claim filed by me then or at any time since, but that I simply submitted to the Grand Secretary and Treasurer such evidence of the death of Shadoan as was in my possession.

On July 12, 1907, I received a letter from attorneys employed by Shadoan's wife requesting me to forward them blanks relative to claim and make such suggestions as I might deem proper. This letter I did not answer but forwarded it to the Grand Secretary and Treasurer, and I suppose he answered it. Not only did I not answer this letter, but absolutely refrained from having any dealings whatever with Mrs. Shadoan's attorneys.

Nothing further developed until the month of November, 1908. Brother Perry, master of Lodge 424, called at my house with a letter which he had received from the Grand Secretary and Treasurer, asking him to ascertain from former members of Old Kentuck Lodge 584 if anything had been heard or seen of R. P. Shadoan. I immediately took up correspondence with a number of former members of that lodge and found that two had seen and spoken to him at Lexington, Ky., during the latter part of August, 1908. This information I gave Brother Perry and he forwarded it to the Grand Secretary and Treasurer.

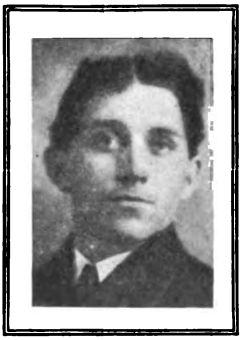
In conclusion let me say that Old Kentuck Lodge 584 is now defunct and has surrendered its charter in compliance with the Constitution of the B. of L. F. and E., but it is not indebted in the sum of a single cent to the Grand Lodge or any person. The absconding collector was apprehended through the action of the officers of the defunct lodge and has since made good, and from this I feel justified in saying that the loyalty of the officers of Old Kentuck Lodge 584 should never be either questioned or doubted.

L. DIESEL.

* * *

Another Defaulter.

On October 1st last, Robert F. Pirtle was expelled from this lodge (No. 100) for nonpayment of dues. He left here about the 10th of that month and has been passing himself off as a Brotherhood man ever since. He went to Fulton, Ky., where Bro. H. E. Massey was employed, and got Bro. Massey to stand for his board bill, and several other brothers stood good for him for different things. All of a sudden he left for parts unknown, leaving several Brotherhood men to pay his bills. Bro. Massey, being a member of this lodge, had seen Pirtle in our lodge room and thought he was still in good standing. Pirtle is about five and one-half feet tall, weighs about 150 pounds, has black hair and brown eyes and freckled complexion. He also has a small mark on his face. Four of his front teeth are crowned with gold. All Brotherhood men should be on the lookout for him.



ROBT. F. PIRTLE

GEO. BILLINGS,
President, Lodge 100.
R. A. STONE,
Acting Secretary, Lodge 100.

Resolutions of Regard for Past Grand Master Hannahan.

At a meeting of the Ohio State Legislative Board held February 16th, the following resolutions were adopted:

WHEREAS, Our Honorable Brother, John J. Hannahan, has for the past twenty-three years devoted his time and his eminent talent to furthering the interests of our Brotherhood in many and varied official capacities; and,

WHEREAS, He so valuably served and assisted the Ohio State Legislative Board in their recent difficulties in the courts of the State of Ohio by his judicious advice, in which he was completely and fully sustained in each and every court, and

WHEREAS, He has so eminently, conscientiously and faithfully served our Brotherhood in the capacity of Chief Executive as Grand Master during the past six years, and has always well and truly performed the duties of every office to which he has been called, in the best interests of all the members of our Brotherhood; therefore,

Be it Resolved, That we, the members of the Ohio State Legislative Board of the B. of L. F. and E., tender to our honorable retiring Grand Master, Brother Hannahan, this expression of our grateful appreciation for his invaluable and faithful services to our Brotherhood during all this time and in every official capacity in which he has served. The Ohio State Legislative Board will always look to Brother Hannahan with great respect for his loyalty and efficient services to our Brotherhood. And we await any further opportunity to do him honor; and,

Be it Further Resolved, That a copy of these resolutions be spread upon our minutes and a copy of the same be sent to Brother Hannahan.

Adopted by a unanimous vote of the Board, February 16th, 1909.

A. E. RANSBOTTOM,
Secretary.
R. B. ACKERMAN,
Chairman.

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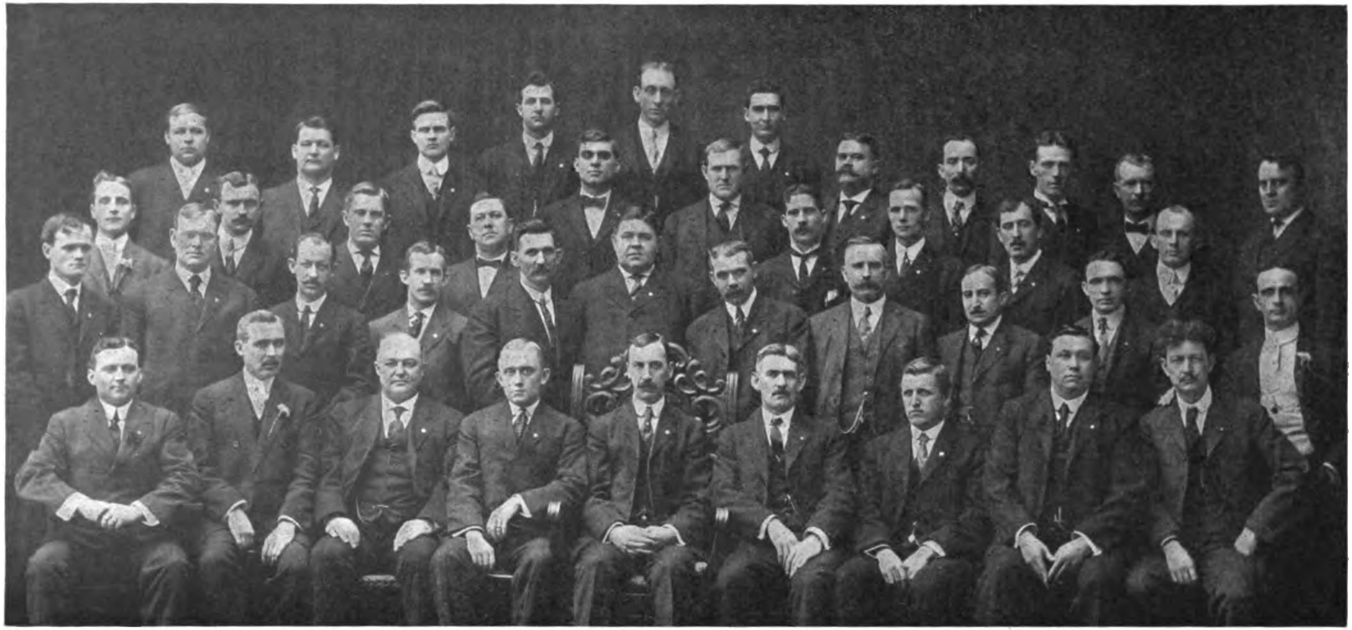
A Very Practical Message.

Messages are so common in these days that we are apt to underestimate their significance. Whereas in olden days they were given but seldom, and then came with great unction as a word from those in authority to the many who had little time or opportunity to think.

Today thoughts are quickly communicated in many different ways. The Kaiser speaks to the Reichstag, the President to Congress, a lecturer to an audience, and in a few minutes the telegraphs have spread the speaker's words to the "four corners" of the earth and the great presses have soon printed it into the newspapers that are so easily obtained, even by the humblest citizen, and so greatly enjoyed and thoroughly digested. We live in an age of general intelligence—an age in which democracy has leveled all distinctions at least in the domain of ideas. There are some dangers in this freedom of opportunities, and because such dangers are so subtle they are often overlooked. We have so many things told us, so many different solutions offered us for all social and individual problems that we are apt to overlook their seriousness and search for some new way to handle them. We are cloyed and surfeited not only with material luxuries, but our minds grow weary because so much is presented to their attention.

Every true fireman, like every other true citizen, is virtually concerned not only in "the good of the order" but in breathing the spirit of fraternity. He yearns to do all he can to promote the general welfare. He knows if he is broad-minded enough to be of positive value and force in the world, that if the great order to which he belongs is to prosper, the people about him, his neighbors and fellow citizens, must share in that prosperity. This leads him to the query, "How shall I best fit myself, in my inner self, to be a potent, genuine force in the community in which I live and by the people with whom I mingle?" It is astonishing how so many miss the mark of their high calling because they ignore or fail to recognize a few single truths. The laws of the universe in any direction are never complex. He who knows thoroughly addition, subtraction, multiplication and division has all there is to build a successful mastery of arithmetic upon. And so the "art of living" is most successfully mastered by a thorough understanding and practicing of the common everyday courtesies.

The writer has no idea of preaching a sermon, but merely to amplify some ideas about the basic principles of success in the great field of winning men and en-



W. L. Buzzard, 463 J. P. Alms, 310 J. J. Taubler, 703
W. W. Nunn, 462 A. I. Kauffman, 381 C. R. Walker, 287 J. L. Yoder, 673 A. L. Pelter, 498 T. T. Skinner, 647 B. Duffy, 398
E. S. Hammond, 231 S. A. Bracken, 343
E. Evans, 333 H. Krebs, 753 Arthur Williams, 646 A. T. Irvin, 104 T. M. Wright, 250 H. E. Knauff, 338 H. E. Mench, 235 B. S. Wynn, 11 J. V. O'Brien, 86
Geo. Hill, 601 J. C. Davis, 174 J. T. Smith, 383 G. W. Skelly, 561 B. M. Smith, 72 A. P. Kelly P. A. Lynch, 75 Jos. Compton, 484 I. D. Miller, 253 D. A. Kelly, 3 W. H. Kimberly, 465
Bd. Directors 3d Vice-Pres. Bd. Directors Bd. Directors
R. B. Pidcock, 253 W. T. Shannon, 490 H. N. Stewart, 552 W. D. Feldmeyer, 214 A. Bartlett H. G. McComas, 7 A. G. Townsend, 220 W. Q. Maust, 347 H. E. Core, 392
Bd. Trustees Bd. Trustees Bd. Trustees Vice-Chairman Chairman Sec. and Treas. Alt. Sec. and Treas. Bd. Directors Bd. Directors

JOINT PROTECTIVE BOARD, PENNSYLVANIA LINES EAST OF PITTSBURG AND ERIE, 1909 nobling character which were laid down by one who earned a martyr's crown and imperishable renown as one of the world's heroes.

Listen to the message of Peter in his second epistle, and when you have assimilated his ideas act upon them, and as a member of the B. of L. F. and E. you will have received an inspiration to better service, to stronger sympathies and to a more fruitful life. Peter was, like all great souls, an idealist, but with practical plans for carrying his ideas into effect. He had visions of the truth, but it was results he wanted. He sought to catch men with the same zeal that he caught fish, but with an immeasurably higher purpose. The first essential which he laid down was faith. It is as true now as it was then that if we are to do anything worth mentioning in this old world we must have faith as our chief asset. We must believe in men if they are to be our leaders. We must have confidence in a cause or an institution if it is to mean much to us.

The boy who becomes a member of the "Grand Old Order," to be a winner, to be successful as a member, must, first of all, have an unbounded faith in its merits as a fraternal order. Without this faith he is a failure at the outset. With it he has a good strong footing to push forward. But there are other elements in the constitution of success. Peter added virtue to faith—the kind of virtue that means strength which comes through self-control. The necessity of this kind of strength is as urgent in the struggle of life today as it was nineteen centuries ago.

Then the venerable man suggested the value of knowledge. Nothing has contributed to the glory of America like the universal quest for knowledge. The business world is calling in every direction for men who can *do things*, and in order to meet the requirements of this business world one must first know about them and the laws which govern them. The rule applies with force in the field occupied by the fireman. He who wishes to become an effective and useful member must become thoroughly acquainted with the history of the Order, its needs, its excellence and its possibilities.

Patience must not be omitted. Faith and strength and knowledge are important but they must be supplemented by forbearance with one's self and others when under stress. It is this quality which often puts every man to the supreme test.

Godliness is that capacity and desire to be true in all relations of life. The man whose whole trend is to help others about him and make his career one which is based on purest motives and wholesome influences within and without himself, cannot fail to have the benedictions of heaven. And the more genuine and whole-hearted a man is the more valuable will he be, not only in public activities, but in his home lodge.

We came near forgetting Peter's ingredient for temperance. And this word was used by this good man in its broadest meaning. Not only care, discretion and sanity in what we eat and drink, but as well in what we think, say and do. It means that a man is not to rush to extremes. Nothing destroys one's influence so quickly as rashness of speech or action. The successful fireman will walk along an even, temperate way and realize that one of the great essentials of power among men consists in being temperate.

The last two essentials Peter gave are brotherly love and kindness. These are the impelling, all-absorbing forces which, harnessed rightly to those already spoken of, are sure to reap rich fruitage in any line of undertakings.

Without them all else is chaff. With them the man who has the other virtues is bound to win. These are essentials to success. Peter in his letters to man which have come down to us through the centuries has voiced them. They spell triumph to whoever employs them. They are vital and unimpeachable. Peter said to his friends in closing, "If ye do these things ye shall never fail." What is applicable to Christianity in its largest sense is applicable to fraternal orders.

Whoever wants the most splendid record attainable as a member of the B. of L. F. and E. can find in these basic principles of action, enunciated by one who was a successful fisher of men, the best possible platform upon which to stand.

MEMBER 218.

EVERY-DAY SERMONS

BY ADELBERT CLARK.

"You can preach a better sermon
With your life than with your lips."
Let the world take lead, but never
Let it win you with its tips.
Be a social man of honor
With the rich and poor as well,
Teaching men that *this* is Heaven,
Just as much as it is Hell.

Heaven is not a place for shiftless
Men, and shiftless women, too;
God has made it for a purpose—
For the good deeds that we do.
When you walk among the mighty
And the humbler ones of life,
You should walk among them smiling,
Loosing every chain of strife.

You should only scatter kindness
Where the way seems dark and lone,
Knowing that we all are brothers
'Neath one bright and holy throne.
You should make this life worth living,
Full of sunshine hour by hour,
Leading weak and lowly spirits
In the midst of life and pow'r.

"You can preach a better sermon
With your life than with your lips."
Go to church for strength for service,
Sin and selfishness eclipse.
Then go forth and live the Christlife
Giving sunshine day by day,
Teaching men that Heaven is only
Found through Work, and Song, and Play.

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Correspondence

LODGE 148—(*J. W. Bain, Tyler, Texas.*) We are still doing business at the same old stand and prospering. However, we have a little dissatisfaction at present, but I think it will be all over in about a month, as I presume all lodges have more or less trouble of the same kind. Business is fairly good on the road and all the boys are making pretty good time. The saw mills in the pine woods division are all opening up in full blast, and prospects are fine for a good fruit crop this year, which makes us feel like business is going to be still better. We are now experiencing one of the coldest spells we have had for years, the thermometer registering about zero. This is a good indication for a fine vegetable and fruit year, so you can see that prosperity is staring our boys in the face along the line of the Cotton Belt.

Our goat is still kept busy with what little material we have left, as nearly all who are eligible, especially out of Tyler, have already joined our ranks. We have new applications, however, coming in every meeting night, and have only lost three or four in the last two years by withdrawal. I hope some of the other brothers of 148 will write something for the Magazine, so that the members of all sister lodges will know what I have had to say in the columns of our official publication has met with their approval. I certainly wish the B. of L. F. and E. and all of its members a most prosperous new year.

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LODGE 182—(*Member, Roanoke, Va.*) No doubt the readers of the Magazine will be surprised to hear from us through its columns, and as a member I desire to say a few words just to let the boys know that we are still in the land of the living. Like the old oak down by the spring, we have stood many a storm but we are "still in the ring."

I have been a member since September, 1906, but so far have seen nothing whatever concerning Lodge 182 in our Magazine. Let me say to our brother and sister lodges that while we have not as many members at this time as we had in 1906 and 1907, due chiefly to the depression in business on our road, I am glad to be able to tell them that we are using our goat every once in a while.

On February 4th last we had twenty-three candidates for initiation and many more seeking admission. Business on our road is not increasing very rapidly, and as a matter of fact we cannot expect to increase our membership very fast, owing to the fact that over half our engines have two engineers on them, and of course that caused a number of firemen to be cut off.

Now that we have started into a new year let us begin with the resolve to make this "the banner year of our organization." It gives me pleasure to say that the majority of our members express themselves as if they mean business. No doubt some may think because business is dull and so many men are out of employment that the "brotherhoods" are weakening. For 182 let me say that we are as strong today with our 77 per cent. of firemen as we were when we were 88 per cent. strong. The boys all seem full of "brotherhood;" they attend meetings more regularly and always seem to be anxious to do something for the "Brotherhood." We meet every Thursday night and always have a good attendance. We have no trouble getting vacant chairs filled when officers are absent, and no difficulty in getting up committees; in fact, no time since I have been a member have I seen such an ambitious set of men; all seem anxious to help each other. I for one regard it as a pleasure as well as an honor to be called on to do something for the "Order," and take just the same interest as I would if I were doing it for myself alone, and I do hope that every member of this "great band" feels the same as I do. One of the happiest thoughts in life is to think we have helped some other brother.

May we never forget to be loyal to our Order and its teachings. "Do unto others as you would have them do unto you" and we will always come out ahead in this world and the world to come.

May our trips on the rail be successful and our works on earth be good. And when we sign our last register may we still be members of this great Brotherhood.

I extend best wishes to all brothers.

LODGE 136—(*Member, Lindsay, Ontario.*) On the evening of January 21st last a large number of the members of Lodge 136 gathered at the comfortable home of Bro. W. G. Graham and wife in this city to do honor to our worthy brother, W. J. Fee, who for a number of years past has served faithfully and with marked ability in the most responsible offices of the lodge. As chairman of our local board and vice-chairman of the Joint Protective Board, Grand Trunk Railway, positions demanding the highest qualities of fairness, prudence and courage, he has ever discharged the duties pertaining thereto with even-handed justice and has given unqualified satisfaction to all parties concerned.

Brother Fee is one of our engineer members, and notwithstanding that strenuous efforts have been put forth to induce him to leave our brotherhood, he has been steadfast and true, and through his earnest work Lodge 136 is in excellent condition and we are retaining our engineer members.

He holds educational classes whenever opportunity offers, and through them our members are enabled to pass their examinations without difficulty. He is tireless in his efforts to advance the interests of the lodge and its members, and his work is deserving of the highest commendation.

In order that we might show in a small measure our deep appreciation of his sterling personal worth and of his efficient service in the responsible positions he has filled in our lodge and of his interest in the well-being of our members, after all had assembled at Brother Graham's home Bro. W. L. Gordon in a neat and very appropriate address presented Brother Fee with a massive natural oak easy chair with automatic fittings. Brother Fee in a few well-chosen words thanked his fellow members for this unexpected proof of their good will.

Social entertainment and the enjoyment of choice refreshments occupied the remainder of the evening, at the close of which Brother and Sister Graham were tendered a hearty vote of thanks for their hospitality.

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LODGE 709—(*J. T. Ward, Bonne Terre, Mo.*) I am a charter member of this lodge, having transferred from No. 6, De Soto, Mo., in order to help organize a lodge here on this line. We have been organized almost two years, in which time we have increased in membership from twenty-two until at present we are forty-six strong in the "old tried and true." We had an application on file last meeting, which shows we are still climbing the ladder. We have a nice set of officers that take quite an active part in the advancement of the Order. We meet the first and third Sundays of each month. Last meeting we had a visit from one of our Grand Officers, Bro. A. Dillon, Fourth Vice-President. He gave us a most interesting talk on the good we have been doing since we were organized, which was highly appreciated by all members present. The boys that were not at the meeting that day missed a chance of their life. We are all looking forward to the time when Brother Dillon will visit us again, and hope that circumstances will permit of his staying with us longer, for he has always something in store which the fireboys are always glad to hear.

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LODGE 136—(*L. Gordon, Lindsay, Ont.*) Our lodge is in a very prosperous condition with a membership of 54, and initiating new members nearly every meeting. We also have a room equipped for instruction on the air brake and engine, which is of great benefit to the fireman in preparing for examination. We had with us on January 31st last our Second Vice-President, Bro. E. A. Ball, who ably instructed us on the secret work; also on subjects regarding the welfare of our Order, to the delight of every member present, and for which he received a hearty vote of thanks. We only wish that Bro. Ball's visits were more numerous.

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LODGE 641—(*Jacob F. Hudlow, Eldon, Mo.*) On Sunday afternoon, January 31st last, the members of Wild Rose Lodge No. 252 of the Ladies Society, gave the boys of old 641 a very delightful entertainment. A silver offering was taken and the treasury of the lodge was increased some seven or eight dollars. This lodge was organized on December 2, 1908, with twelve charter members, by Mrs. Ella Dearing, of Lodge 151, L. S., St. Louis, Mo., and the boys of 641 are very proud of it and wish them success.

Much credit is due Bro. John F. Roach for the promotion of the organization of this lodge. There are a number who are eligible to membership who have not as yet been examined, and the sisters have their goat in fine shape, expecting to have lots of work for him in the near future. The officers are as follows: Mrs. Delhia Roach, President; Mrs. L. C. Moore, Vice-President; Mrs. Emma Ryan, Past President; Mrs. Anna Gunn, Secretary; Mrs. Harry Hawkins, Treasurer; Miss Mary Roach, Collector, and Mrs. Wm. Trower, Chaplain.

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LODGE 321—(*Member, Chapleau, Ont.*) Have been a member of Snow Drift Lodge for about four years and thought I would let the brothers know that we are still doing business, but not at the same old stand, as our lodge room was completely destroyed by fire a short time ago. I am glad to say we are doing business in a most prosperous way in another hall, business being brisk on this division at present. We have a good staff of officials to work under. Mr. Reid, our master mechanic, cannot be excelled. He is doing his best to make it comfortable and right for the boys. Quite a number of the boys were promoted to the other side of the cab this winter and most of them seem determined to remain with the old "Tried and True." We have about forty-seven per cent. of the engineers running on this division, which speaks well for our lodge and the B. of L. F. and E. in general.

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LODGE 45—(*J. E. Zimmerman, Little Rock, Ark.*) I will try and let the brothers know we still retain our charter in the same spirit as before, but, oh my, the panic hit us a bad jolt. Our boys being unable to make even board money, could not keep up their lodge dues, and there being too many for the lodge to carry all, we were compelled to lose several of our young members. Since business has improved, however, we have been busy bringing them back into the fold. We are kept busy lately trying to keep our 2,000-ton drags going on the rest we are getting at each end of the road. Our coal is something the fireman who has not handled it before cannot brag on. I notice all experienced firemen who come here use it all right.

This company, the Iron Mountain, is hiring none but experienced firemen.

Well, brothers, should you come this way please come and see some of the members of old 45, but do not do as some others have done lately, viz., telling our President that they are firemen and then not coming with him, and when he reminds them of it, act foolish. They are doing some very hard work against us, but we are not near losing our charter if 146 members count for anything.

Several of our members are complaining about not receiving their Magazine, and on the strength of the complaints our lodge has appointed me Magazine agent. I am trying to do all in my power towards instructing members how to notify the Editor and Manager of their change of address, in case they have moved. If all the brothers would read their Magazine regularly I cannot see where there would be any need of the secretaries instructing them how to get it. Brothers, if you haven't an old Magazine laying around, borrow one and tear out or cut out that blank form which has been so frequently published, and send it to the Editor and Manager, with your correct address written plainly thereon, and I am sure your Magazine will be forthcoming.

I guess some of my old friends of Red River Lodge No. 8 will be surprised to hear from me out in Arkansas—I got a drink of Arkansas river water and had to stay with it. I am trying this process of letting all the brothers know that old 45 is not dead yet.

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LODGE 654—(*Member, Virginia, Minn.*) I would like to tell the boys of the success this little northwestern lodge is enjoying. Of course, we have the same high class conscientious workers so prominent in railway circles, devoted to their homes and to their lodge, faithful to their employers and to themselves. I am glad to say we have not lost one of our members since we were granted a charter. It is a fact that thirty per cent. of our members are on the right side, yet none have left the ranks of the old "Tried and True." We are always busy looking for new recruits and generally each meeting night finds an application before the board. The boys, with the aid of our goat, handle the applicants in an effective manner. We would like to be in a position to inaugurate a Ladies Society. I am sorry to say that a few of our members are a trifle negligent. Would like to see every member attend regularly, as it is of great benefit to the lodge and the members themselves in particular. I trust fortune will be bountiful with her favors on all the officers and members of the B. of L. F. and E. during the present year.

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LODGE 217—(*L. J. Moore, E. St. Louis, Ill.*) We have been pretty busy here on the St. Louis Division of the Illinois Central for about two weeks on account of the blizzard, making it impossible to haul full tonnage over the division, and we are in hopes that the business will continue to come our way, as we feel as though we can stand lots of work after about 16 months of a lull.

Old 217 is drifting along as usual. We manage to get a little feed for the goat every once in awhile, but I am sorry to state some of our members are a little lax in coming to lodge meetings, but we always have a quorum and manage to do some work.

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LODGE 172—(*Member, Ottawa, Ont.*) Business on the C. P. R. out of Ottawa at present is very dull. Every day young engineers are set back, but just the same Lodge 172 has every available man she can get. I would like if some of the brothers could suggest some way or means of getting members to attend lodge meetings better than they do, instead of just coming to get their obligation, for that is all you see many of them do. I do not know where the lodge would be if it were not for a faithful few. I hope our new President will get the same hearty support as our late Grand Master received while in office. I also hope the Editor will have continued success in keeping our excellent Magazine up to its present high standard.

One of our worthy brothers, James D. Sweet, met his death on November 23d last, along with his engineer, at Sandbank, a collision between two freight trains causing the wreck. His father wishes to thank the members of Lodges 172 and 262 for their many acts of kindness to them in their bereavement. He says ours is a noble Order and can do much good.

I think the idea of the card system in changing addresses, as published in the January issue, is an excellent thing and should meet all requirements.

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LODGE 756—(*Thomas Hueston, New Toronto, Ont.*) I have read with interest the article which appeared in the January number of the Magazine, which was sent in by our worthy treasurer, Bro. J. G. Hird. I feel that duty calls me to reply to the kindly remarks that have been made. Our lodge was organized on August 20, 1908, and we have only missed one meeting in that time, which goes to show we have the proper material in Etobicoke Lodge. We have an excellent set of officers, who preserve harmony amongst our members, and no one needs to fear bringing their grievances to the lodge room. Bros. Walker and Wharum are old-time war horses. Secretary Hughes attends strictly to business; Bro. Beale keeps a careful watch over all the members, and three good, faithful watchdogs guard him, and there are Bros. Colville and Terry, who will let no one pass them unless they have the price.

Each brother feels that it is his duty upon entering the lodge room to see that the fire of brotherly love is burning brightly, so that when he speaks words of encouragement and advice they will create harmony, which is at all times necessary for the success of a lodge. The fire of brotherly love is in that way kept burning brightly in Lodge 756.

The next duty is to see that the proper firing tools, viz., the shovel, hook, slash bar, shaker bar and hoe are in their places upon the tender. The shovel we use in our vocation to transfer the coal from the tender to its proper place upon the fire to increase the intensity of heat as desired. We learn from this that in placing words of kindness on our refractory brothers we shall reap the reward which comes to those who heap coals of fire upon their heads, and thus fortify ourselves with the power of love. In times of trouble and adversity this power will not fail us.

The hook we use to remove small clinkers so they will not interfere with proper combustion. Our Order teaches us to single out small obstacles that are at all times likely to arise, and to carefully and cautiously remove them from our midst, so that they will not be a hindrance to the proper working of our Order.

The slash bar we use only in case of necessity to remove large clinkers, and when absolutely necessary to clean the fire during a trip. This teaches us that when misunderstandings and dissensions arise in our midst it will sometimes become necessary to use the bar of justice, so that our Order may be properly preserved for the good of the majority and the protection of the widows and orphans. The shaker bar we use to move our grates so as to shake the ashes and dross into the pans. A proper use frequently avoids the use of either the hook or slash bar. We learn from this that by carefully watching and gently shaking from our minds inharmonious feelings that at times may arise, we will be able to keep the fire of brotherly love burning with sincerity and truth.

The hoe we use to clean the pan and thus remove all that is useless, and in our lodge when once we have removed the causes for inharmonious feelings we never refer to them again.

In conclusion, I wish to say that I expect to hear from some of our good brothers on the sand box, clean or dry, oil cans, signal lamps, etc., and I feel that among some of our members like Bro. Kasack, we will undoubtedly finish up this debate for the good of the Order, closing without ceremony.

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LODGE 624—(*Member, Wymore, Neb.*) I always take great pleasure in reading the Magazine and pay particular attention to the letters from our various lodges, and it appears to me as though I've read something from every lodge excepting Old Blue Valley. I feel somewhat ashamed to start anything at this late date, but it might be well for us to appear in some corner of our famous Magazine. We are just a few in number —fifty at present—but if business ever gets back to its old stand I feel safe to say that we will soon see an increase. Most of our nonmembers are to a certain extent out of our reach, being on branch lines. We have a few on our preferred runs, however, who would come under the head of former members. I hope we will be able to bring them back to our fold. I am also glad to see the monthly payment system started. I think this will do away to a certain extent with the expulsion list. Our worthy Assistant President informs me that he is going to put most of his time in organizing the B. of L. F. and E. We hope that Brother Wilson will succeed, but, boys, let us do our share and no doubt his efforts will prove successful. Let us not only advertise this great Order by wearing its emblems, but let our actions and deeds speak for us. We must try and show our love through honesty, kindness and charity. Actions of this kind will not only speak well for the B. of L. F. and E., but also for ourselves in time to come. True enough we all have our faults, but if we prove ourselves honest, kind and charitable we never need fear our end.

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LODGE 492 — (*Member, Smithville, Texas.*) We are still doing business at the same old stand, but not in the same old way, for lately our goat has had all he could do in the way of initiations and he always manages to give the candidates a race for their money. We have a very good set of boys here and a number who are on the right side, but the B. of L. F. and E. still looks good to them. We would have good jobs here if we only had something to burn. We get what we call three "S" coal—slack, slate and soil. We have burned nearly everything else but grease, and suppose we will get that if they make a change. Brothers, get out among the boys who are not lined up and give them an application; explain the good that there is in the B. of L. F. and E., and I am sure they will be looking for the doctor pretty soon.

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LODGE 743—(*Member, Tampa, Fla.*) You will find a few of the old "Tried and True" in this part of the country. Things are slow down this way, not much doing. Some of the people do not think the money panic is over and are afraid to let go of theirs. I am on a new road which has just 48 miles completed. They have three big engines, 20 x 26 inches, and one switch engine 20 x 26 inches, and then two small engines that were used in construction work, all burning wood. The big engines carry 200 pounds of steam, have electric headlights and two Nathan improved No. 10 injectors, one on the front of boiler head and the other up in the right-hand corner. The fire boys do not have to fool with the water. The fire door is just above my waist. I measure five feet, six and one-half inches, so you can judge how high the door is. We have all steel cabs and wagon top boilers, and the engines steam fine with our "long leaf coal." A fireman in this part of the country doesn't stand much show, as there are so many negroes, and they keep the white man down a good deal. There are a number of engineers who would rather have a negro, so that they can use him on the road and at home. They have him carry their grip, shine their shoes and then cut wood at home for them. The officials, however, are beginning to get their eyes open and are looking out for white firemen, there being at present a larger per cent. of white firemen on the roads in Florida than there was two years ago.

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LODGE 43—(*Member, St. Joseph, Mo.*) The following is submitted to those thoughtful readers who use their minds in conjunction with their eyes in reading, and as an appeal to those who use their pen, evidently, without help from either their minds or eyes. Surely any outside man reading sketches from the correspondence columns of our Magazine, and not knowing the actual conditions or the ability most of us possess of kicking, would be appalled at the terribly inhuman treatment we are forced to submit to. After becoming better acquainted with us the outsider would be amused for a time with our whimperings, and then, finally, it seems to me, he would become disgusted and ready to be classed by us as one of the "blood-thirsty demons."

Stop and consider, my worthy brother, and confine your daily howlings to the ears of your local Protective Board, and when again you feel the "ink-slinging fit" coming on, just think of something good to say to our Magazine readers, even though you find it necessary to call largely on your imagination to supply you, so that when those of the outer world who have become interested, not only in our Magazine, but in our organization itself, read they may be agreeably surprised at the new tone.

For my own lodge I can say, calling not too largely on my imagination, that I think it the finest lodge on the map, in the best town on the map, and filled with the best people on the map. We also live on the "biggest," "longest" and "muddiest" river on the map. We work for one of the biggest railroads on the map, which has at its head some of the best railroad men on the map. (I have been working for them for ten years and they have never given me one cent, nor can I recall that they have ever given any other employe one cent, which shows conclusively that they know their business.) Now I shall wait patiently to see some other brother's imagination break loose. Let us overlook, even though we neither forgive nor forget the happenings of the past. We may meet a few despicable people and see a few despicable actions on their part, but just forget them. There are lots of good fellows in the world and we can be one of them if we try.

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LODGE 515—(*Member, Chickasha, Okla.*) As I have been a member of this lodge for nearly two years and I don't remember of seeing any letter from this section of the Great State of Oklahoma, I thought I would write a few lines to let the "Tried and True" know that Washita Lodge 515 is still in existence. We are all working for the good of those that are going to come into the fold soon. However, we are pretty strong. Our brothers are scattered over about five hundred miles of territory and of course we have a hard time getting together on our regular meeting days, which should be every Sunday at 2:30 p. m. We are getting some new material to work on nearly all the time and when a man becomes eligible he has a great many pursuers, until finally he is roped in if elected. Our winter has been very favorable here, with the exception of a few very cold spells. Business seems to be fairly good, although power is very scarce to move the merchandise. We have a very good grade of coal nearly all the time, but sometimes it gets low in the chute and we get the fine cut or dust off of the whole car. We have the elevator coal chute and it gets ground up very fine sometimes. We have all classes of engines from the 8-wheel standard to the large consolidated freight engines. Some of the large consolidators are oil burners, but the old black diamond and scoop is the standard at present. I like to see things progressing on the farm, for when the farmer raises a good crop that gives us old "tallers" a job with scoop in hand to haul it off to market and bring something back in return—that makes business for us and also the railroad company.

Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge requesting that a notice be published in the Magazine inquiring for such address or other information, same will be complied with. However, the Magazine can not undertake the office of a collecting agency and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice:

Chas. S. Wann.—Has not been heard from for four years. Was a fireman on the C. & E. I. R. R.; also fired out of Little Rock, Ark., about four years. Any one in possession of any information concerning him will confer a favor on his brother, who is very anxious to locate him, by writing to Edw. Wann, care Chas. A. Weber, 125 91st st., South Chicago, Ill.

J. B. McGuire.—Formerly belonged to Lodge 477, B. of L. F. and E., Galesburg, Ill. Any one knowing his address or in possession of any information regarding him will please correspond with M. L. Houlihan, Recording Secretary, Lodge 477, B. of L. F. and E., 974 S. Academy st., Galesburg, Ill.

Wm. R. Meagher.—Was a locomotive fireman on the Jersey Central before going out west several years ago. Two years ago was firing on the U. P. R. R., at Black Rock, Utah. His mother is very anxious to locate him and any one knowing his whereabouts will please correspond with Mrs. John J. Meagher, 12 W. 12th st., Bayonne, N. J.

John Freitag.—Member of Lodge 240. Last heard of in Texas about two years ago. Anyone knowing his address or in possession of any information regarding him will please correspond with A. W. Turner, Recording Secretary of Lodge 240, B. of L F and E., 209 Everard st., Jackson, Mich.

J. O'Donnell.—Was formerly employed as freight conductor on the B. R. & P. Ry. Left Bradford, Pa., about ten years ago. Is supposed to be railroading in the west. He is about five feet nine inches in height and rather stout; has brown hair and eyes and is of florid complexion. Anyone who can give any information concerning his whereabouts will please correspond with T. F. Campbell, Secretary, Lodge 85, B. of L. F. and E., 45 Troup st., Buffalo, N. Y.

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Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Receipts, including that for the present quarter ending March 31, 1909, belonging to E. A. Dorsey, member of Lodge 194, B. of L. F. and E., were lost recently. If presented please take up and return to U. G. Hafer, Secretary of Lodge 194, B. of L. F. and E., P. O. Box 471, Missoula, Mont.

Traveling card belonging to D. L. Hardman, of Lodge 273, B. of L. F. and E., was recently lost or stolen. Description on same is as follows: Stature, medium; eyes, brown; hair, brown; employed as engineer. If presented please take up and send to D. L. Hardman, 3404 Garfield st., Denver, Colo.

Small grip containing an old card and some three or four receipts belonging to R. A. Patrick, formerly a member of Lodge 618, B. of L. F. and E., was stolen about the 15th of December last. The grip was afterwards recovered but the card and receipts were gone. Supposed to have been taken by an ex-Brotherhood man. If found please take up and forward to R. A. Patrick, Oroville, Cal.

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Acknowledgments.

Bro. John C. Braden, of Lodge 578, desires to thank the Brotherhood of Locomotive Firemen and Enginemen for allowing him $500 on his beneficiary certificate on account of sundry disabling injuries received in a wreck October 14, 1907, on the L. & N. R. R. He also wishes to thank the members of his lodge for the kind assistance they gave him in securing his claim, and hopes to live long enough to see an agreement made between the B. of L. F. and E. and the L. & N. R. R.

Bro. Joseph J. Murphy, of Lodge 105, wishes to thank the officers of his lodge for their kindness and assistance rendered him. He also wishes to thank the Brotherhood in general and the Grand Lodge in particular for the prompt payment of his disability claim.

Bro. J. Stephenson, of Lodge 457, desires to thank the Grand Lodge of the B. of L. F. and E. for the payment of his disability claim allowed by the Eleventh Biennial Convention. He states that their action in this matter calls forth his most sincere gratitude, and it is his sincere wish that the B. of L. F. and E. will, through ages to come, continue to care for the dear ones of its departed brothers, and also those brothers who, like himself, are crippled on the way.

Bro. Wm. Lewis, of Lodge 535, desires to thank the Brotherhood for the prompt payment of his disability claim. He also wishes to thank the members of his lodge especially for their kindness to him during his stay in the hospital.

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The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of January, 1909:

B. of L. F. and E. Lodges 64, $10; 107, $5; 174, $6; 188, $10; 281, $5; 291, $12.50; 334, $10; 337, $5; 348, $15; 358, $7.50; 360, $12; 388, $5; 501, $10; 593, $16.50; 622, $10; 697, $5..........	$144 50
L. S. to B. of L. F. and E. Lodges 23, $5; 149, $2; 154, $5; 158, $3; 159, $5; 164, $5	25 00
O. R. C. Divisions..............	145 00
B. of R. T. Lodges............	201 35
B. of L. E. Divisions..........	377 45
L. A. C. Divisions...........	98 80
L. A. T. Lodges..............	23 60
G. I. A. Divisions.............	73 00
Receipts from individuals, amounting to $1.00 and under	9 00
Lodge 529, B. of R. T., by C. A. Booton	25 00
Grand Lodge L. S. to B. of L. F. and E., by Mrs. Mary DuBois	200 00
Union meeting held by Division 165, G. I. A...............	3 00
Division 498, B. of L. E......	8 55
Station 20, Portage, Wis......	1 25
J. Fabin, Laredo, Texas......	4 99
Dividend on stock donated by Hamilton Carhartt	4 20
Grand Lodge of the B. of L. F. and E., by A. H. Hawley.	864 31
Proceeds of a penny drill, Division 376, G. I. A........	4 00
Total	$2,214 00

Miscellaneous.—Twenty shares of capital stock donated by Hamilton Carhartt, of Detroit, Mich.; one barrel containing clothing from Mrs. J. H. Scott, Crestline, Ohio.

Respectfully submitted,
JOHN O'KEEFE,
Sec. and Treas., R. R. M. H.

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Beneficiary Statement

OFFICE OF GENERAL SECRETARY AND TREASURER.
PEORIA, ILL., February 1, 1909.

To Subordinate Lodges:

The following is a statement of receipts in the Beneficiary Department for the month of January, 1909:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	460 00	77	398 25	153	142 00	229	230 50	305	132 25	381	331 00	457	160 75	533	78 75	609	57 75	685	117 25
2	34 00	78	156 00	154	113 25	230	462 25	306	245 00	382	......	458	69 00	534	292 75	610	......	686	27 25
3	711 75	79	70 50	155	86 25	231	542 25	307	202 25	383	232 75	459	75 75	535	164 25	611	83 50	687	57 50
4	300 50	80	......	156	252 50	232	201 00	308	77 25	384	216 75	460	95 25	536	133 50	612	99 50	688	94 00
5	300 50	81	117 25	157	......	233	220 50	309	328 75	385	3 00	461	139 50	537	108 00	613	25 50	689	94 25
6	336 00	82	139 50	158	115 50	234	167 25	310	269 00	386	61 50	462	187 75	538	181 00	614	277 50	690	......
7	227 75	83	374 50	159	224 00	235	227 00	311	95 25	387	133 25	463	183 75	539	281 25	615	105 25	691	40 50
8	453 25	84	120 75	160	186 75	236	419 25	312	186 00	388	172 50	464	183 75	540	270 50	613	72 00	692	......
9	371 75	85	314 50	161	61 50	237	370 75	313	139 50	389	100 25	465	208 75	541	150 50	617	145 00	693	21 75
10	836 25	86	200 50	162	463 75	238	199 25	314	192 00	390	159 50	466	165 50	542	185 25	618	......	694	105 00
11	258 75	87	160 75	163	178 75	239	76 00	315	162 00	391	......	467	140 50	543	262 50	619	84 00	695	......
12	225 00	88	137 75	164	88 00	240	429 00	316	224 50	392	162 75	468	27 00	544	142 50	620	......	696	59 00
13	271 75	89	63 00	165	67 00	271	289 00	317	84 25	393	166 75	469	129 00	545	88 50	621	57 25	697	67 50
14	457 25	90	92 25	166	239 00	242	282 50	318	305 25	394	24 00	470	229 50	546	44 25	622	208 50	698	132 00
15	137 25	91	444 75	167	166 00	243	117 00	319	150 00	395	96 75	471	36 00	547	113 25	623	128 25	699	88 75
16	518 25	92	189 75	168	249 00	244	160 25	320	......	396	181 00	472	319 75	548	......	624	75 00	700	43 50
17	187 00	93	91 50	169	375 00	245	......	321	136 50	397	67 75	473	33 25	549	127 50	625	88 25	701	173 75
18	166 75	94	406 50	170	264 50	246	253 50	322	103 25	398	138 25	474	141 00	550	67 75	626	......	702	181 75
19	273 50	95	67 00	171	118 50	247	487 00	323	54 75	399	102 00	475	......	551	221 75	627	79 50	703	45 50
20	46 50	96	194 25	172	98 25	248	275 75	324	153 00	400	129 25	476	86 50	552	208 50	628	124 50	704	179 75
21	393 50	97	396 00	173	271 75	249	290 25	325	107 75	401	274 00	477	......	553	......	629	28 00	705	84 00
22	84 00	98	245 50	174	632 00	250	222 25	326	200 75	402	......	478	......	554	108 75	630	140 50	706	31 50
23	140 00	99	528 25	175	327 75	251	335 25	327	243 25	403	59 25	479	103 00	555	107 25	631	......	707	70 50
24	331 00	100	178 50	176	161 25	252	307 50	328	......	404	130 75	480	46 50	556	62 25	632	67 50	708	185 25
25	291 75	101	359 25	177	172 25	253	298 50	339	67 50	405	260 25	481	135 25	557	240 00	633	122 25	709	83 50
26	230 25	102	152 75	178	203 25	254	101 50	330	249 50	406	80 25	482	......	558	207 25	634	202 50	710	100 25
27	251 50	103	54 75	179	131 50	255	......	331	159 00	407	273 75	483	58 50	559	......	635	163 75	711	77 25
28	193 00	104	120 75	180	82 25	256	171 50	332	82 00	408	214 00	484	158 25	560	58 50	636	61 75	712	26 25
29	132 75	105	99 25	181	52 75	257	102 25	333	268 75	409	244 00	485	916 50	561	230 25	637	......	713	87 00
30	163 25	106	89 50	182	311 25	258	55 00	334	258 00	410	163 50	486	67 00	562	349 50	638	154 00	714	19 50
31	154 50	107	257 50	183	254 50	259	89 50	335	53 25	411	171 75	487	23 25	563	247 50	639	56 50	715	45 75
32	163 75	108	......	184	70 50	260	286 25	336	104 25	412	214 75	488	72 75	564	217 50	640	55 75	716	73 50
33	139 00	109	182 75	185	86 25	261	......	337	309 25	413	39 00	489	154 50	565	56 50	641	105 75	717	24 00
34	203 50	110	162 00	186	34 50	262	309 00	338	148 50	414	140 25	490	250 75	566	185 50	642	84 25	718	42 75
35	118 75	111	202 25	187	95 75	263	190 00	339	......	415	147 75	491	68 25	567	139 75	643	56 50	719	156 75
36	127 50	112	53 75	188	378 00	264	106 50	340	137 50	416	182 75	492	257 00	568	......	644	109 00	720	12 75
37	178 75	113	139 50	189	266 50	265	346 50	341	216 25	417	96 75	493	64 75	569	208 50	645	67 75	721	39 00
38	97 50	114	57 00	190	66 00	266	227 25	342	237 50	418	210 75	494	107 75	570	98 25	646	275 50	722	65 25
39	123 75	115	116 75	191	402 00	267	98 25	343	70 50	419	......	495	61 75	571	......	647	86 50	723	33 25
40	359 25	116	104 75	192	320 75	268	51 00	344	161 25	420	93 00	496	145 00	572	84 25	628	48 00	724	58 00
41	58 50	117	111 25	193	......	269	140 25	345	232 50	421	87 00	497	108 00	573	243 25	649	45 00	725	55 00
42	51 00	118	48 75	194	459 75	270	336 75	346	25 50	422	79 75	498	123 75	574	133 50	650	54 00	726	49 50
43	168 75	119	132 00	195	100 75	271	144 25	347	87 00	423	44 50	499	41 25	575	84 75	651	136 75	727	47 25
44	275 75	120	215 00	196	130 00	272	58 50	348	209 00	424	146 25	500	125 00	576	81 75	652	......	728	75 00
45	429 25	121	......	197	99 00	273	222 50	349	336 00	425	101 25	501	218 50	577	54 00	653	99 00	729	39 00
46	31 50	122	43 00	198	330 25	274	127 00	350	......	426	288 25	502	218 50	578	260 00	654	137 00	730	76 00
47	305 00	123	266 25	199	178 25	275	320 25	351	40 75	427	69 50	503	173 50	579	67 00	655	56 50	731	117 75
48	350 00	124	164 25	200	72 00	276	272 25	352	109 75	428	71 25	504	73 50	580	47 25	656	97 00	732	46 75
49	117 75	125	......	201	154 25	277	147 00	353	149 00	429	126 00	505	57 00	581	67 75	657	146 00	733	55 00
50	85 50	126	158 50	202	195 75	278	27 00	354	263 25	430	93 75	506	114 00	582	81 75	658	91 00	734	95 50
51	181 75	127	259 50	203	273 50	279	87 25	355	222 00	431	67 50	507	174 00	583	97 50	659	165 00	735	88 50
52	320 75	128	133 25	204	267 00	280	......	356	192 25	432	214 00	508	328 25	584	33 75	660	75 00	736	46 75
53	142 50	129	269 25	205	108 25	281	......	357	72 75	433	......	509	78 75	585	91 00	661	85 00	737	19 50
54	396 25	130	490 75	206	71 25	282	37 50	358	166 75	434	172 50	510	154 25	586	40 50	662	51 25	738	21 75
55	60 25	131	46 75	207	289 00	283	95 25	359	130 75	435	138 25	511	196 00	587	......	663	......	739	80 25
56	222 25	132	113 50	208	76 50	284	648 25	360	114 75	436	230 25	512	149 25	588	65 25	664	73 00	740	74 25
57	527 50	133	613 75	209	163 50	285	......	361	118 50	437	36 00	513	96 00	589	66 75	665	76 75	741	48 25
58	223 00	134	63 75	210	83 50	286	228 00	362	86 00	438	150 50	514	103 00	590	......	666	262 50	742	32 25
59	477 50	135	193 50	211	265 00	287	1152 00	363	909 00	439	98 25	515	174 00	591	214 75	667	85 00	743	67 00
60	312 25	136	73 50	212	170 25	288	102 00	364	121 75	440	178 75	516	115 50	592	128 25	668	114 00	744	36 75
61	131 25	137	108 25	213	162 75	289	125 75	365	40 50	441	195 50	517	......	593	......	669	64 50	745	38 00
62	93 75	138	287 50	214	537 00	290	192 50	366	82 50	442	133 75	518	31 50	594	157 75	670	271 00	746	70 50
63	......	139	356 75	215	384 00	291	72 75	367	187 50	443	199 00	519	270 50	595	59 25	671	99 00	747	61 50
64	......	140	331 75	206	133 00	292	39 75	368	103 25	444	......	520	40 50	596	120 75	672	96 00	748	60 00
65	201 00	141	629 75	217	196 25	293	158 50	369	160 25	445	204 75	521	161 25	597	......	673	710 25	749	101 25
66	151 50	142	164 25	218	240 25	294	263 25	370	69 50	446	160 00	522	255 75	598	97 75	674	42 00	750	44 00
67	114 75	143	......	219	238 00	295	317 75	371	172 50	447	157 00	523	......	599	107 25	675	171 75	751	49 50
68	113 50	144	47 25	220	567 50	296	366 00	372	158 50	448	660 00	524	46 00	600	193 75	676	55 50	752	51 75
69	80 25	145	211 25	221	125 25	297	273 75	373	171 75	449	316 75	525	150 25	601	250 50	677	131 00	753	48 75
70	196 50	146	258 25	222	120 00	298	......	374	159 25	450	285 00	526	42 75	602	......	678	......	754	......
71	334 25	147	231 50	223	232 50	299	134 50	375	87 00	451	157 00	527	141 00	603	132 50	679	101 75	755	64 50
72	331 50	148	266 00	224	......	300	239 25	376	39 00	452	129 75	528	217 50	604	......	680	85 50	756	33 75
73	253 00	149	426 75	225	103 50	301	......	377	165 25	453	54 00	529	170 75	605	148 25	681	134 50	757	66 00
74	158 25	150	315 75	226	286 50	302	403 00	378	543 50	454	158 75	530	121 25	606	29 25	682	77 00	758	33 00
75	459 75	151	136 50	227	92 00	303	102 00	379	382 00	455	112 00	531	100 00	607	......	583	......	759	......
76	......	152	325 25	228	423 75	304	198 75	380	107 25	458	151 75	532	123 25	608	......	684	......	760	135 25

Received during month of January $118,426.75

Respectfully submitted, A. H. HAWLEY, G. S. and T.

Statement of Death and Disability Claims

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM DECEMBER 31, 1908, TO JANUARY 31, 1909.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
1412	James A. Kendall	468	Death	Sept. 26, 1908	$ 500	Collision.
1426	Neil Lawley	668	Disability	Dec. 29, “	500	Consumption of lungs.
1454	Charles A. Carroll	58	Death	Nov. 6, “	1,500	Consumption of lungs.
1456	Joseph W Davidson	247	“	Oct. 12, “	1,500	Run over by engine.
1457	Chas. M. Humphrey	476	“	“ 17, “	1,500	Collision.
1458	Joseph J. Murphy	105	Disability	Dec. 10, “	1,500	Bright's disease.
1459	Edward T. Trout	287	Death	Nov. 10, “	1,500	Typhoid fever.
1461	French J. Jones	625	“	“ 9, “	1,500	Collision.
1462	John F. Lann	45	“	Oct. 27, “	1,500	Abscess of liver.
1464	Carl F. Schuster	296	“	Nov. 2, “	1,500	Run over by cars.
1467	Peter Deitz	363	“	“ 15, “	1,500	Typhoid fever,
1468	James B. Taylor	63	Disability	Oct. 21, “	1,500	Amputation of foot.
1470	Samuel W. Montz	409	“	Dec. 22, “	1,500	Locomotor ataxia.
1472	June Blewett	238	Death	Nov. 14, “	1,000	Malarial fever.
1475	Geo. V. Bothwell	733	“	“ 18, “	500	Derailing of engine.
1477	Royden R. Miller	594	Disability	Oct. 30, “	1,000	Amputation of foot.
1479	David A. Trevors	233	Death	Nov. 4, “	1,000	Pneumonia.
1480	Guy G. Allen	344	“	“ 16, “	1,500	Consumption of bowels.
1481	Cyrus W. Short	13	Disability	“ 30, “	1,500	Bright's disease.
1482	John C. Schley	86	Death	“ 10, “	1,500	Collision.
1483	William T. Tucker	241	“	“ 20, “	1,500	Boiler explosion.
1484	James D. Sweet	172	“	“ 23, “	500	Collision.
1486	John W. Bartholoma	599	“	“ 22, “	500	Collision.
1487	Ralph C. Keeler	635	“	“ 10, “	1,500	Caught in belt.
1491	Patrick McGough	316	“	“ 29, “	1,500	Cirrhosis of liver.
1492	Walter E. Trask	4	“	“ 14, “	1,500	Heart failure.
1496	Elmer T. Bradshaw	250	“	“ 13, “	1,500	Boiler explosion.
1497	Thomas B. New	574	Disability	Dec. 7, “	1,500	Amputation of foot.
1502	Anthony F. Stuckhart	228	Death	Nov. 20, “	1,500	Striking building near track.
1503	Walter A. Austin	85	“	Dec. 1, “	1,500	Appendicitis.
1504	Louis Dambach	241	“	“ 8, “	1,000	Derailng of engine.
1509	Clarence H. Williams	364	“	Nov. 25, “	1,500	Run over by train.
1478	Joseph P. Hampton	185	“	“ 28, “	1,500	Consumption of lungs.
971	Mike Shanley	55	“	Apr. 21, “	1,500	Gunshot wound.
1435	John M. Connoly	539	“	Oct. 30, “	500	Gunshot wound.
1473	Robert Roe	66	“	Nov. 5, “	1,500	Collision.
1495	Joseph Patterson	253	“	Dec. 4, “	1,500	Cirrhosis of liver.
1485	George G. Snoke	599	“	Nov. 22, “	1,000	Collision.
1465	Roscoe Cravens	204	“	“ 10, “	1,500	Dysentery.
1336	Martin J. Smith	399	“	Aug. 31, “	1,500	Bright's disease.
1493	Ernest D. Cox	4	“	Nov. 16, “	500	Gunshot wound.
1471	Frank G. Thompson	510	Disability	“ 6, “	1,500	Amputation of foot.

Death Claims Paid.

26—A	**$39,000.00**
4—B	**4,000.00**
6—C	**3,000.00**
36	**$46,000.00**

Disability Claims Paid.

4—A	**$6,000**
1—B	**1,000**
1—C	**500**
6	**$7,500**

42 death and disability claims paid, aggregating $53,500.00

Pending Claims January 31, 1909.

56 death claims aggregating	**$77,000**
23 disability claims aggregating	**33,500**
Total of 79 claims aggregating	**$110,500**

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Statement of Death and Disability Claims

FILED WITH THE GENERAL SECRETARY AND TREASURER DURING THE MONTH ENDING FEBRUARY 15, 1909.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
43	James G. Hadden	381	Jan. 16, 1909	Death	Typhoid fever	$500
44	Harry C. Buell	84	" 18, "	"	Typhoid fever	1,500
45	Alex. C. McDonald	341	" 19, "	Disability	Paralysis of spine	1,500
46	Joseph M. Hendrix	111	" 19, "	"	Loss of one eye, ear and nerves affected	1,500
47	Ernest A. Hawkins	341	" 19, "	Death	Derailing of engine	1,500
48	Edwin Stuart	501	" 20, "	"	Derailing of engine	1,500
49	Edward G. Fisher	508	" 20, "	Disability	Amputation of foot	1,000
50	J. J. Thompson	439	" 20, "	"	Partial amputation of hand	1,500
51	W. E. Hubbard	45	" 21, "	"	Loss of hearing	1,500
52	H. E. Stump	529	" 22, "	"	Deaf in both ears	1,500
53	Ed. M. Dufur	409	" 22, "	"	Amputation of foot	1,500
54	John N. Moad	440	" 22, "	Death	Ruptured blood vessel	1,500
55	C. D. Mathews	156	" 23, "	Disability	Sundry ailments	1,500
56	John B. Heaton	447	" 25, "	"	Amputation of hand	1,500
57	Norman G. Fish	33	" 25, "	Death	Run over by train	500
58	Wm. J. Johnson	4	" 25, "	"	Heart disease	1,500
59	Geo. O. Wilson	133	" 25, "	"	Appendicitis	1,500
60	Franklin L. Nation	94	" 25, "	Disability	Blind in one eye	1,500
61	W. P. Stewart	491	" 25, "	"	Permanent injury to shoulder	1,500
62	Chas. A. Russell	562	" 26, "	Death	Pneumonia	1,500
63	Chas. W. Stuart	440	" 26, "	Disability	Bright's disease of kidneys	1,500
64	John D. King	342	" 26, "	Death	Collision	2,000
65	John E. McMonigle	284	" 27, "	Disability	Loss of eye, injuries to side of body	1,500
66	Burton E. Saxby	138	" 27, "	"	Paralysis of arm	2,000
67	Chas. A. Brown	87	" 27, "	"	Ununited fracture of left arm	500
68	Alexander S. Redden	319	" 28, "	Death	Struck by engine	500
69	Patrick Mulvey	454	" 28, "	Disability	Loss of sight of one eye, and sundry injuries	1,500
70	Ellsworth L. Riley	454	" 28, "	"	Varicose veins and ulcers	1,500
71	Geo. K. Hart	59	" 29, "	"	Permanent paralysis and locomotor ataxia	1,500
72	Jesse T. Berry	28	" 29, "	Death	Derailing of engine	500
73	Edward L. Longacre	386	Feb. 1, "	"	Uremic poisoning	1,500
74	Clyde Guyer	573	" 1, "	"	Appendicitis	1,000
75	Arthur Springall	178	" 1, "	"	Scalded	1,500
76	W. H. Britton	70	" 1, "	"	Congestion of lungs	1,500
77	Wesley P. Surrett	551	" 3, "	"	Gunshot wound	1,500
78	James W. Walsh	10	" 3. "	"	Paresis	3,000
79	Volney Cronk	149	" 3, "	"	Struck by derrick	1,500
80	M. M. Sayre	167	" 3, "	Disability	Loss of sight in one eye	1,500
81	Walter A. Wiggin	485	" 3, "	Death	Pneumonia	1,500
82	V. Van Vickle	400	" 4, "	Disability	Locomotor ataxia	1,500
83	James White	241	" 4, "	Death	Heart disease and kidney trouble	1,500
84	Arthur L. Wade	410	" 4, "	Disability	Partial amputation of hand	1,500
85	Chas. H. Donelson	568	" 5, "	"	Overcome by gas	1,500
86	H. M. Montgomery	220	" 5, "	Death	Hemorrhage of brain	1,500
87	Frederick J. Closser	326	" 8, "	"	Typhoid fever	1,500
88	Thos. F. Burgan	318	" 8, "	"	Collision	1,500
89	Thos. Connors	100	" 8, "	"	Falling from engine	1,500
90	Alford B. Carroll	70	" 8, "	"	Blood poisoning	1,500
91	Dan Murphy	330	" 8, "	Disability	Partial blindness	1,500
92	Chas. Jenkins	90	" 8, "	Death	Apoplexy	1,000
93	Willis C. Walter	266	" 9, "	"	Pneumonia	1,500
94	Ernest H. Vaden	147	" 9, "	Disability	Blind in one eye	1,500
95	Joseph C. Edwards	485	" 10, "	"	Paralysis	1,500
96	John Cooper	117	" 10, "	Death	Falling from engine	1,500
97	Lloyd W. Weaver	501	" 11, "	"	Gunshot wound	1,000
98	Joseph J. Seifert	291	" 11, "	"	Diabetes	1,500
99	Chas. F. Lusk	101	" 12, "	Disability	Bright's disease	1,500
100	John W. Rahr	72	" 12, "	"	Articular rheumatism	1,500
101	James L. Combs	304	" 12, "	Death	Run over by engine	1,500
102	Merle A. Champion	485	" 13, "	"	Consumption of lungs	1,500
103	Geo. H. Whistler	34	" 13, "	"		1,500
104	John H. Kelt	540	" 13, "	Disability	Amputation of both feet	1,500
105	Wade H. Veal	393	" 13, "	"	Blind in one eye	1,500
106	Albert E. McLeod	475	" 13, "	Death	Derailing of engine	1,500
107	Maurmer Root	181	" 15, "	"	Collision	1,000
108	Patrick J. Kelly	543	" 15, "	"	Heart disease	1,500
109	Herman F. Rhods	29	" 15, "	"	Falling from engine	1,500
110	William Curran	3	" 15, "	"	Apoplexy	1,500
111	Walter F. Crawford	223	" 15, "	"		1,500
112	Amos C. Price	680	" 15, "	"	Falling from engine	1,500
113	James W. Malone	236	" 15, "	Disability	Fracture of hip, ankle and wrist	1,500

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Statement of Benevolent Claims.

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM DECEMBER 31st, 1908, TO JANUARY 31st, 1909.

Claim No.	NAMES.	Lodge No.	Amount Carried.	Amount Paid.
1225	George A. Newton	229	$ 500	$ 500
48	William O. Hambright	289	$1,500	1,500
572	Charles R. Johnson	201	1,500	1,500
623	Bengt. P. Anderson	398	1,500	1,500
1996	Chas. Clausen.	194	3,000	2,000
653	Jensen J. Oxford	279	1,500	1,500
664	Augustus McAllister	543	1,500	1,500
665	William A Rosine	199	1,500	1,500
706	John T. Frank	141	1,000	500
737	Charles R. Shapard, Jr	506	1,500	1,500
751	H. P. Locklin	371	1,500	1,500
823	Oscar Peterson	87	1,500	1,500
847	Irvin Myser	326	1,500	1,500
877	Alexander W. Temple	156	1,500	1,500
881	Ralph Ridgley	701	1,000	500
124	T. M. Pickenpaugh	396	1,500	1,500
888	Cicero McGehee	163	1,500	1,500
568	John Pickering	163	1,500	1,000
115	Sanders Tregoning	86	1,500	500
806	James Arthur	705	1,500	500
885	John C. Braden	578	1,000	500
894	John Saunders	472	1,500	1,500
1178	James J. Brennan	101	1,500	1,500
566	Frank Shuppert	482	1,500	1,500
901	Clarence Martin	558	1,500	500
902	Henry Desport	203	750	750
923	Chester B. Wilson	27	1,000	1,000
929	W. J. Stephenson	457	1,500	500
915	Robert L. Maxwell	54	1,500	1,000
848	Charles W. Moxley	432	1,000	500

30 claims paid aggregating $34,250.00.

Treasurer's Notice, General Fund Assessment No. 3.

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., March 1, 1909.

To the Treasurers of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that you are required to forward to the Grand Lodge the sum of Twenty-five Cents for General Fund Assessment No. 3 for each beneficiary, non-beneficiary and honorary member whose name appears upon the rolls of membership February 28, 1909. You are hereby requested to make remittance for General Fund Assessment No. 3 as soon as possible, and in no event to reach the Grand Lodge later than March 20, 1909.

Treasurers of all lodges who have remitted seventy-five cents for all their members in accordance with suggestion made in General Fund Notice No. 1 will pay no attention to this notice.

Yours fraternally,

W. S. CARTER,
President.

A. H. HAWLEY,
General Secretary and Treasurer.

Beneficiary Assessment No. 1-2.

General Fund Assessment No. 4.

(SERIES I.)

OFFICE OF THE GRAND LODGE OF THE B. OF L. F. AND E.
PEORIA, ILL., March 1, 1909.

To all Members of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that monthly Beneficiary Assessments Nos. 1 and 2 for the payment of death and disability claims, General Fund Assessment No. 4 and Local Assessments are now payable and must be paid to the Financial Secretary of your Lodge on or before April 1, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$6 60	$0 25	......
Class D Members	4 40	25	......
Class A Members	3 30	25	......
Class B Members	2 20	25	......
Class C Members	1 10	25	......

Local Lodge Assessment in such an amount as may be determined by your lodge, but in no case to be less than 25 cents.

ORGANIZED DEC. 1, 1873
GRAND LODGE

Any member failing or declining to make payment, as above provided, will be subject to expulsion from the order, as per Section 170 of the Constitution, said expulsion taking effect April 2, 1909.

Yours fraternally,

W. S. CARTER,
President.

A. H. HAWLEY,
General Secretary and Treasurer.

Notice to Financial Secretaries.

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., March 1, 1909.

To Financial Secretaries of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified to collect monthly Beneficiary Assessments Nos. 1 and 2, and General Fund Assessment No. 4 (now due and payable on or before April 1, 1909), from all benificiary members on the rolls of your lodge March 31, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$6 60	$0 25	......
Class D Members	4 40	25	......
Class A Members	3 30	25	......
Class B Members	2 20	25	......
Class C Members	1 10	25	......

You will also collect from all honorary and non-beneficiary members General Fund Assessment No. 4, and from all members Local Lodge Assessment in such an amount as may be determined by your lodge (in no case to be less than 25 cents), and pay same to the Treasurer of your lodge on or before the fifth (5th) day of April, and forward a report to the General Secretary and Treasurer of all expulsions on account of non-payment of assessments, as per Section 170 of the Constitution.

ORGANIZED DEC. 1, 1873
GRAND LODGE

Yours fraternally,

W. S. CARTER,
President.

A. H. HAWLEY,
General Secretary and Treasurer.

ANNUAL STATEMENT
OF THE
Brotherhood of Locomotive Firemen and Enginemen
(Beneficiary Department)
For the Year Ending December 31, 1908.

Published by direction of the laws of Illinois and in the form adopted by the Insurance Department of that State.

Ledger Assets December 31, 1907		*$120,517 29*
INCOME.		
Mortuary and disability assessments	$1,047,153 50	
Interest	7,208 62	
Refund on Bond Premium	15 62	
Refund on Attorney's fees	12 50	
Transfer, account error	2 25	
Re-deposit of H. Robert's Trust Fund	588 81	
Total income		1,054,981 30
Sum of both amounts		$1,175,498 59
DISBURSEMENTS.		
Death claims	$589,113 67	
Disability claims	182,000 00	
Total claims paid	$771,113 67	
Salaries of officers and trustees	3,764 00	
Salaries of office employes	10,841 17	
Salary of Grand Medical Examiner	2,500 00	
Insurance and State Department fees	10 00	
Rent	549 00	
Printing and stationery	2,358 37	
Postage, telegraph and telephone	1,873 67	
Legal expense in litigating claims	50 00	
Other legal expenses	60 00	
All other disbursements	1,704 89	
Total Disbursements		794,824 77
Balance on hand December 31, 1908		*$380,673 82*
LEDGER ASSETS.		
Deposited in banks on interest		$380,673 82
NON-LEDGER ASSETS.		
Assessments actually collected by Subordinate Lodges, not yet turned over to Grand Lodge		265,162 50
Gross assets		$645,162 50
LIABILITIES.		
Death claims, due and unpaid (1)		$500 00
Death claims reported but not yet adjusted (59) (a)		82,403 00
Disability claims reported but not yet adjusted (20)		26,000 00
Due missing beneficiary, claim 2190	$187 50	
Due missing beneficiary, claim 2458	588 81	
Due missing beneficiary, claim 33	750 00	
Due missing beneficiary, claim 155	900 00	
Due missing beneficiary, claim 408	900 00	
Due missing beneficiary, claim 707 (b)	333 33	3,659 64
Total liabilities		$112,562 64

(a) Funeral deduction of *$97.00* paid on one claim. Claim held pending the appointment of Guardian in Europe.

(b) These liabilities are shown in Ledger Accounts with the missing beneficiaries, whose whereabouts are unknown.

EXHIBIT OF CERTIFICATES.

	Number.	Amount.
Benefit certificates in force December 31, 1907	*64,061*	*$88,336,500*
Benefit certificates written during year	8,849	11,327,500
Totals	72,910	$99,664,000
Benefit certificates terminated during year	9,500	13,112,500
Benefit certificates in force December 31, 1908	*63,410*	*86,551,500*

EXHIBIT OF DEATH CLAIMS.

	Number.	Amount.
Claims unpaid December 31, 1907	*83*	*$111,087 50*
Claims incurred during year	413	564,588 81
Totals	496	$675,676 31
Claims paid during year	436	589,113 67
Claims unpaid December 31, 1908	*60*	*$86,562 64*

EXHIBIT OF DISABILITY CLAIMS.

	Number.	Amount.
Claims unpaid December 31, 1907	*16*	*$23,000 00*
Claims incurred during year	125	185,000 00
Totals	141	$208.000 00
Claims paid during year	121	182,000 00
Claims unpaid December 31, 1908	*20*	*$26,000 00*

Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa.

Matters for the Grand President should be addressed to Mrs. Georgie M. Sargent, 2815 Fourteenth street, N. W., Washington, D. C., and that for the Grand Secretary and Treasurer to Mrs. Mary E. DuBois, 1603 First street, Boone, Iowa.

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From the Grand President.

Amendments to Constitution.

On account of the Grand Lodge of the Brotherhood of Locomotive Firemen and Enginemen changing the time of holding its biennial meetings, from the second Monday in September to the first Monday in June; its fiscal year from July 1 ending June 30, to January 1 ending December 31, the latter requiring the officers of the subordinate lodges to hold office from January 31 to December 31, it becomes necessary for the Ladies Society to make similar changes. To that end blanks have been sent to all lodges with a view to securing necessary authority to make the said changes in the new edition of the constitution, which is now being printed, and, it is hoped, will be ready for distribution on or about March 15, 1909. The said blanks should be returned to the Grand Secretary and Treasurer so as to reach her not later than March 1, 1909, in order that the printing of the amended constitution need not unnecessarily be delayed.

Transfer of Members, etc.

Under the law now in effect, before the transfer card of a member can be accepted, or a former member admitted by special dispensation, it will be necessary that the regular ballot, as used in connection with balloting for applicants, be used. Three or more black balls will cause the rejection of card or request that application be made for a special dispensation. To obviate the possibility of an embarrassing situation arising it is suggested that before application is made, either by transfer card or special dispensation, by the secretaries, that the lodge proceed to ballot upon the admission of the applicant.

Increased Insurance.

Under the new laws members eligible can carry an insurance certificate for either $200, $400 or $500. But one certificate will be issued to an insurance member and it must be one of the series herein stated. Where an increase or decrease in insurance is desired the old certificate must be, in conformity with law, forwarded to the Grand Secretary and Treasurer for cancellation. An erroneous impression seems to prevail that a member can carry a $300 certificate, as will be seen by referring to the printed proceedings of the Ninth Biennial Meeting of the Grand Lodge. The said meeting simply authorized issuing the three series above mentioned.

G. M. SARGENT,
Grand President.

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Big Ten.

Below is given the membership of the ten largest lodges of the Ladies Society of the B. of L. F. and E., as reported February 1, 1909:

1.	No. 3, Hazel, Peoria, Ill.	124
2.	No. 142, Empire, Buffalo, N. Y.	121
3.	No. 60, Pride, Harrisburg, Pa.	100
4.	No. 151, Missouri, St. Louis, Mo.	89
5.	No. 70, Holly, Buffalo, N. Y.	88
6.	No. 113, Ft. Orange, Albany, N. Y.	81
7.	No. 125, Charity, Jackson, Mich.	74
8.	No. 51, Grayson, Denison, Texas.	73
9.	No. 15, Forest Flower, Cleveland, Ohio	72
10.	No. 91, Mountain City, Altoona, Pa.	68

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A Brave Act.

In an old family Bible, in the back among a group of portraits, is one of a youth. A mere slip of a boy clad in the prevailing fashion of his day. There is nothing unusual about the picture unless it is the tiny curl of fair hair that encircles it, placed there by his mother's loving hands, and yet—

There were but two children born in that family and both of them were boys. The oldest was tall and dark like his mother, while the younger lad had his father's blue eyes and fair curling hair. His mother always had said "That he should have been a girl," and as long as she could do so she kept him by her side, and until his sixteenth birthday had passed seldom was she separated from him.

Boys grew to manhood quickly in those days and when he was less than eighteen he declared his intention of entering the service of the railroad. Overthrowing every objection he finally became a flagman on his father's train, and served in that capacity over two years.

On the morning of November twenty-eighth, eighteen hundred and seventy-one, he left his home carrying a small valise and his dinner pail. He was to be relieved at the other end of his run, where he was to officiate as best man at his brother's wedding, and those who knew him best said: "There was to have been a second wedding but a little later when he and the little maid of honor would have held first place."

The trip was but half over and he was standing in the gangway of the engine joking with the fireman, when one of the trainmen passed him on the narrow step and started to jump to the ground to turn a switch; the man slipped and would have fallen but the boy caught him and literally flung him out of the way, losing his own foothold and falling upon the ground, the rear wheels of the tender passing over both limbs, severing them from his body.

His mother reached his bedside in time, but not so the brother, for as the whistle of the incoming passenger train told the watchers and the dying boy he was there, the tiny life spark flickered out and the meeting is yet to come.

The dawn of the wedding-day found the bridegroom miles away accompanying the remains on its last sad journey to its final resting-place, the bride and little maid of honor left behind sobbing in each other's arms.

Today there is a simple shaft of marble above the silent sleeper which bears his name and this inscription:

"Greater love than this hath no man,
That he layeth down his own life for
another."

IMOGENE BATES.

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Golden Rule 253.

Who says Joint Board 581 hasn't a helper?

Its a mistake, anyway, for Golden Rule No. 253 took upon herself that office December 29, 1908. We have thirteen charter members (and thirteen isn't going to be an unlucky number in this case, either).

Our organizer was Mrs. Martha East of Galion, Ohio, who exemplified the ritualistic work very ably. Our officers are as follows: President, Mrs. Roy Reynolds; V. P., Mrs. John Brown; P. P., Mrs. Roy Stone; Secretary, Mrs. O. L. Boice; Treasurer, Mrs. Will Eden.

At eight o'clock, in company with our brothers, we gathered at the hall, where we spent the evening very pleasantly and at a seasonable hour delightful refreshments were served.

The brothers showed their appreciation throughout the evening, also, in a very substantial way, by the neat little sum they turned into our treasury. The brothers tried to initiate us before leaving for our homes, but say, boys, who came out ahead?

We will endeavor to keep the sisters posted in regard to our growth and usefulness.

MRS. ROY H. STONE,
Chicago Junction, Ohio.

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Wild Rose Lodge 252.

Wild Rose Lodge 252 was organized on the 3d day of December, 1908, at Eldon, Missouri, with twelve names on its charter, by Sister Ella Dearing of Lodge 151 of St. Louis, Missouri.

At the close of the secret session the sisters assembled at the home of Sister Roach, where a tempting banquet was served and followed by a musical program.

To each and every member of the L. S. may the new year bring joy, happiness and success.

Fraternally,
MRS. ELLA DEARING,
St. Louis, Mo.

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*Why American Mothers Fail.**

III.—DESTROYING THE INSECTS AT BLOSSOMING TIME.

A wise mother will make long-stored wisdom bear fresh fruit. All of her reading can be utilized. Long ago she read that "a word unspoken is like a sword in thy scabbard—*thine;* if vented, thy sword is in another's hand." She can draw a lesson from it for her son in the power of silence and reserve. She also read that "respect for others is the first condition of *savoir vivre,*" and she is helped in her task of teaching her girl tactfulness and good manners; and that they are not to be looked for in a labyrinth of negatives, but found walking along the highway in the good sunshine.

In the much-mooted question of manners the imitativeness of children should make the mothers' task easier than it is, for the solution is example, not precept. Imitation is the whole story. A little boy is scolded for not remembering to raise his cap "to the ladies." I have met lads of six and eight to whom this courtesy had already become as instinctive as it was to their father. No more so, no less, but exactly as it was to their father. "Trot father, trot mother, how can foal amble?"

Making all allowance for wide national differences of opinion, there is much in a French mother's sympathy with her son, as he approaches manhood, which seems more intelligent than the Anglo-Saxon way of withholding sympathy at that crisis. Most American mothers suddenly turn into stepmothers at this critical period. Every sentence begins with "Thou shalt not," and she plumes herself upon her righteousness. And her boy? He becomes a stranger to her. The French mother but adds a new comradeship to her old tenderness, full of far-sighted wisdom and fathomless sympathy for existing conditions; not for ideal conditions that do not exist. He and his mother become closer friends than ever, and he does not withdraw himself from her. She cares much more for her boy than for her righteousness—this mother!

It is but a change in the intellectual outlook, and yet surprisingly few American women recognize the necessity for it. When an American mother has the intelligence to understand, she finds that her son will bring to her not only his triumphs but his failures; not only the story of his virtues but that of his sins —man to man—and then only the wisest motherhood can guide him safely out of the wilderness.

But the deepest stain on American motherhood is exactly at this period in the life of her grown son and grown daughter. For some reason, partly temperamental, a large number of mothers fall short of any comprehension of what is demanded of them. Even when they have been faithful in all their earlier trusts, they fail very often at this point.

Her boy, now a man, of course loves her as of old, but she has not been his intellectual comrade, his strongest inspiration, as she might have been had she put her brain into her motherhood, applied what knowledge she had or studied along the best lines running parallel to the lines of his development.

There are scores of helpful hygienic and philosophical books that would aid mothers to approach their problem well equipped. All this is of course also the task of the father, but we are speaking of American conditions, and we may as well exclude him first as last, as he has elected to shed family responsibilities, save that of lavish monetary support. In that particular he is a prince.

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*By Anna A. Rogers. Reprinted by permission of the Atlantic Monthly.—Continued from February, 1909, Magazine.

One illustration cut from the matrix of life is worth a chapter of generalities. One summer night a few years ago four people sat on a high roof near New York City. One could see far down the bay and over to the Jersey shore. There was a middle-aged woman and her son of twenty-three years, an elderly man and his wife—all Americans.

The mother had been boasting of her three boys, their success, their virtues. Under it all was a very natural and pretty pride as of a gardener telling of his roses and their freedom from the worm i' the bud.

A chance word brought politics to the front. The older woman said aside to the young man:

"So you've twice cast your vote! It marks an epoch in a man's life only second to marriage, doesn't it? To take one's part, though small, in the making of history—that is fine!"

The mother laughed.

"My son has never voted, and says he never will—he hates politics, and I don't wonder!"

All as lightly as if telling of a fastidious taste in cravats!

The son added tolerantly, "We men know what a dirty mess it is."

In the older woman's heart moaned a sad voice: *"She is a failure, this mother!* She is blind, and so he, the son, does not see the truth!"

The silence which followed was filled by the languor of the heat and the pressure of low-bending skies.

Then the older man chuckled and muttered:

"There's trouble ahead—low bridge!" For he knew his wife and the hot fires flaming beneath her silence.

"Will you take me over there where I can see the light on the Statue of Liberty?" she presently asked quietly, and she and the youth walked away.

It took her forty-five minutes to do the work, and years have passed, but that man has voted ever since!

Jerking her head in the direction of Bedloe's Island, she began:

"Oh, don't laugh, don't laugh, you have admitted a crime! Don't you know, haven't you been taught, don't you see for yourself that every time an educated man in the United States fails to vote he has slyly slipped a stone out of place in the foundations of that great statue over there—the foundations of our government? Upon your vote rests the security of the whole complicated structure of republicanism, as we Americans are now testing it in the eyes of the world. Whatever you do, do not laugh!"

In the end she held out her hand and spoke gently: "You see, I, being a woman, have no vote, so you must cast yours for yourself and for me, too, as wisely as you can. Will you?"

The mother was still laughing when the older woman bade them good night, but the latter was very sad, having no sons of her own with any need of her.

American women constantly cry out against the smallness of their lives, the limitations that encompass them. If they would but do wisely and thoroughly their apportioned tasks, they would have need of every power possible to humanity, such are the potentialities of true motherhood.

The schools of both son and daughter would be forced into rational, logical lines; the boy would be trained first, last and always for good citizenship; the daughter would not be allowed to drift on, as helpless as a leaf on a stream, with no knowledge whatever of the currents, the cataracts, the whirlpools ahead of her—inevitably ahead of her—on her way down to the broad sea of fine womanhood.

Women fret themselves and others for the right to vote, and they do not see that their son's vote, their brother's, their friend's, is verily their own. They cry out against certain social evils, and they forget that the ranks are ever recruited from among the daughters of Vanity, Uncontrol and Idleness.

Even the childless women of the world have placed upon them the responsibility of motherhood; for every young man can be a task to them, every girl better for their counsel.

There is no excuse for idleness or repining—there is work in plenty for all women; and it is the most honorable work in the world, for

"On the blue mountains of our dim childhood, towards which we ever turn and look, stand the mothers who marked out to us, from thence, our life."

Happy Thought Lodge 243.

Having been appointed correspondent, wil try and let some of the sisters know what we are and have been doing. We are doing nicely. We are nineteen members now, and expect to have three candidates to initiate at our next meeting January 8, 1909.

The sisters entertained the brothers the 27th of November. The hall was beautifully decorated for the occasion in our emblematic colors on one side of the hall and the brothers' on the other side. Some of the brothers surprised us by draping our charter with the colors of each lodge, which we were very much pleased with.

The evening was spent in dancing, and at eleven o'clock a luncheon was served and all had a most enjoyable time.

At our last meeting our sister chaplain, Mary E. Smith, was not present, being called away on account of sickness. Sister Weldy acted as chaplain.

With best wishes to all lodges and a happy new year to every home where the B. of L. F. and E. Magazine goes is the wish of your friend and sister,

MRS. CARRIE SIMMONS,
Minot, N. Dak.

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Another New Sister Lodge.

North Star Lodge 156 sends greetings to all sister lodges.

The work of organization was begun September 1st by Sister Ada Ragless. We did not hold a business meeting until October 27th, when Sister Chapman of Charity Lodge, Jackson, Mich., installed our officers.

Brothers of North Pole Lodge 152 kindly donated us $30 to help defray expenses, for which we are heartily thankful to them.

Our first venture in a social way was a pedro party given at the home of Brother and Sister Lyons, which proved to be such a success that the brothers voted we have another one as soon as possible.

On December 2d a box social was to be given at the home of Brother and Sister McCargo, but owing to a death in the family Brother and Sister Lyons kindly offered their home again. This was also a success both socially and financially.

On New Year's eve we celebrated our first joint annual ball (masquerade) and danced the old year out and the new year in.

The year 1909 promises to be a very prosperous one for us.

Our membership is now 33, with several applications for our next meeting.

MRS. MINNIE GEORGE,
Bay City, Mich.

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The following poem is respectfully dedicated to Mr. and Mrs. Clyde Reddick with the author's best wishes. Mr. Reddick is a fireman on the B. & O. S. W.

A stranger came to our cottage one day
And said, "With your permission I am come here to stay."
It was a wee little mite, as those generally are;
But we never attempted her entrance to bar.

She entered our hearts as she entered our home,
And we thanked the dear Lord for the gift that had come;
Altho' such a tiny—not yet one day old—
We prized her far dearer than silver or gold.

She is now three months old, and as days pass on,
To a fine, healthy youngster the baby has grown;
And already the darling just crows with delight
As her papa returns from a trip in the night.

What a wonderful thing is a sweet baby's love!
What heart throbbing feelings within us do move
As we watch every act of this dear baby fair;
May we keep this sweet gift is our unceasing prayer.

MRS. HENRY B. JONES,
Washington, Ind.

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Sunset Lodge 255.

Sunset Lodge 255 of Beardstown, Ill., was organized on January 21, 1909, by Mrs. Lillie Pennington of Galesburg, Ill., assisted by Mrs. Maud Huber and Mrs. C. W. Buskhalter, also of Galesburg. The work of these sisters being fine in every respect.

Public installation of officers followed the organization, after which refreshments were served, which were much enjoyed by all, especially the brothers.

We expect to increase our membership soon. **JENNIE BLOHN.**

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Electric Belt Lodge 250.

Electric Belt Lodge 250 was organized at Scranton, Pa., with nine charter members. Mrs. A. E. Wilson was elected president, Mrs. Warner vice-president, Miss Agnes Davem secretary, Mrs. J. Seaville treasurer and Mrs. W. Brutzman collector.

This new sister lodge starts out under very promising conditions, and with such kind brothers to aid them there is no reason why they should not prosper. The brothers very generously donated them the sum of fifty dollars to get them started, and they meet in one of the finest halls in the city.

Sister Wilson takes hold of the reins of office in a manner that proves that she is in real earnest, and with such a woman at the head there is no such word as failure for them.

I am indeed indebted to the sisters of No. 250 for the kind treatment I received, and to Sister Wilson for the royal entertainment I received in her hospitable home.

With best wishes for success in all that No. 250 undertakes.

MRS. LIZZIE KEYES,
Carbondale, Pa.

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An Engineer's Wife.

I sit here waiting alone,
While every one else is in bed;
And hour after hour has flown
Past, and the night has grown old.
I hear the shrill blast of a whistle
Borne afar on the still night air,
And my heart is light as a thistle
And the midnight hour is fair.

Why, do you ask, am I happy and gay
When you would be weary and glum?
What does that signal convey
To you in your vigil alone?
Gladly I'll tell thee, dear guest,
The tidings borne up on the breeze
From the valley to me are the best
That my heart ever wishes to hear.
Well I know you do not understand
The habits and ways of my life,
For I am not wealthy and grand,
But I am content with my lot,
And the one boon I ask and crave
Is that I may hear all through my life
While that hand grasps the throttle, that sound,
For I am an engineer's wife.

I have troubles and trials galore,
And things around don't always shine,
And the children strew things on the floor
As they come in from school or play;
And yet when I hear that sound
I think I am truly blest,
And I know that grasping that throttle
Is the hand of him I love best.

And nothing to me is too hard—
No watching or waiting too long
To me as I sit as on guard,
Waiting to hear that old sound;
And I know that again I'm rewarded
For all of my hardships and strife,
And I am not sorry or regretful
Because I am an engineer's wife.

MRS. CARRIE BRETH, Clearfield, Pa.,
Wife of a Member of the B. of L. F. and E.

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Joint Meeting.

Fortune Lodge 120 and Snowflake Lodge 109 held a joint meeting with Brother Straut and Sister Jewell in the chairs. We had for our guests brothers and sisters from New Year Lodge 110 and West Shore Lodge 213, and they helped make an interesting meeting.

After the secret meeting a program was given, first of all a mock wedding, a colored affair in high life, under the direction of Sister Van Antwerp, who deserves thanks for the success of the affair. Brother Gordon, a splendid female impersonator, filled the bill as the timid and blushing bride. Brother Avery acted as groom.

The burnt cork was very sorry to leave our faces after the wedding, but Sister Gordon knows how to wash faces all right. After the ceremony, which was performed by Parson Jenkins (Brother Straub), we had vocal and instrumental music to complete the program.

Refreshments consisting of ice cream and cake were served, and the way the bride and groom devoured the ice cream and cake they sure must have thought it "watermillion."

I have an idea that Sister Fancher enjoyed the skirt dance from the way she smiled.

We extend a cordial invitation to each and all sisters who may be in Syracuse to visit our meetings. We have a good president, good meetings and do good work.

Wishing our sister lodges prosperity and our Editress and Grand Officers success in all their duties.

In F. and C.

MRS. VIOLA AVERY,
Syracuse, N. Y.

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Recipe for Long Life.

"Don't let go of love or love of romance; they are amulets against wrinkles." If the mind is constantly bathed in love and filled with helpful charitable sentiments toward all, the body will keep fresh and vigorous many years longer than it will if the heart is dried up and emptied of human sympathy by a selfish, greedy life, writes Orison Swett Marden in Success Magazine. The heart that is kept warm by love is never frozen by age or chilled by prejudice, fear or anxious thought. A French beauty used to have herself massaged with mutton tallow every night in order to keep her muscles elastic and her body supple. A better way of preserving youthful elasticity is coming into vogue—massaging the mind with love thoughts, beauty thoughts, cheerful thoughts and young ideals.

If you do not want the years to count, look forward instead of backward, and put as much variety and as many interests into your life as possible. Monotony and lack of mental occupation are great age-producers. Women who live in cities, in the midst of many interests and great variety, preserve their youth and good looks, as a rule, much longer than women who live in remote country places, who get no variety into their lives, and who have no interests outside their narrow daily round of monotonous duties, which require no exercise of the mind.

Insanity is an alarmingly increasing result of the monotony of women's lives on the farm. Ellen Terry and Sarah Bernhardt, "who seem to have the endless brightness of the stars," attribute their youthfulness to action, change of thought and scene, and mental occupation. It is worth noting, too, that farmers who live so much outdoors, and in an environment much more healthful than the average brain worker, do not live so long as the latter.—Selected.

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Tribute to Woman.

It takes a hundred men to make an encampment, but one woman can make a home. I not only admire woman as the most beautiful creature that was ever created, but I reverence her as the redeeming glory of humanity, the sanctuary of all the virtues, the pledge of all perfect qualities of heart and head. It is not just nor right to lay man's sin at the feet of woman. It is because women are so much better than men that their faults are considered greater. A man's desires are the fountain of his love, but a woman's desire is born of her love. The one thing in this world that is constant, the one peak that arises above the clouds, the one window in which the light forever burns, the one star that darkness cannot quench is woman's love. It rises to the greatest height, it sinks to the lowest depth, it forgives the most injuries. It is perennial of life and grows in every climate. Neither coldness nor neglect, harshness nor cruelty can extinguish it. A woman's love is the perfume of the heart. This is the real love that subdues the earth; the love that has wrought all miracles of art; that gives us music all the way from the cradle song to the grand closing symphony that bears the soul away on wings of fire. A love that is greater than power, sweeter than life and stronger than death.—Robert G. Ingersoll.

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Notice.

All lodges wishing a copy of the Official Drill Manual can secure same after March 1st from

MRS. MARY E. DUBOIS, G. S. and T.,
Boone, Iowa.

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Letters from Friends.

FROM L. S. 153—(*Lily Ferguson, Schrieber, Ontario, Canada.*) A special meeting of Beaver Lodge 153 was held in our lodge rooms Monday afternoon for the purpose of bidding farewell to one of our oldest members, Sister Minnie Pearson, who has removed from our town with her husband and child to live in Toronto. She has not left our noble Order, although she will be absent from our meetings. At the close of the meeting a beautiful tribute of love and esteem drafted by the members of Beaver Lodge and read by the secretary, Lily Ferguson, was tendered our sister (would like to print the address as given but space forbids), after which Sister Pearson was presented with a beautiful fruit dish as a slight token of the love and good will of the members of Beaver Lodge.

We have initiated two new members right lately and have three applications on file. We are very few in numbers, but hope to grow steadily.

* * *

FROM L. S. 32—(*Viola F. Anderson, Kansas City, Mo.*) We again ask permission to occupy a little space in the Magazine that we all enjoy reading so much.

We are having very interesting meetings, with initiations now and then, but our worthy president, Sister Frantz, tells us to strive a little harder in the future, as we have so many that are eligible to membership in our locality.

To bring a little happiness and sunshine into the hearts of our sick members we have adopted a penny march. This fund is used to purchase flowers for the sick members.

On December 2 we sisters interrupted the brothers' meeting of No. 337 by giving them a surprise. The boys were very kind and immediately gave us possession of the room. We had prepared a short program, consisting of recitations, vocal and instrumental music, after which we enjoyed a splendid talk from Brother Dillon, the Fourth Vice-Grand Master, who happened to be a guest of the brothers on that evening.

Having prepared supper for the brothers early in the evening, the dining room doors were thrown open and all invited to remain and help themselves. We hope to enjoy many more such jolly good times during the winter.

We meet every first and third Wednesday afternoon of each month. Sisters of different societies will always find our latch string out to admit them to our circle.

With best wishes for our Editress, Sister Strong, and to other sisters for the new year.

* * *

FROM L. S. 27—(*Mrs. Pearle Sayre, Wilmington, Del.*) We have been pleased to read of so many new lodges being organized, some every month, so we will not be classed among the new now, as we have been organized since last May.

We have had several social affairs since writing last. We hold joint meetings regularly once a month. We also have a good sum in our treasury.

The brothers have moved since we organized and we are very much pleased with our new quarters. The rooms are large and luxuriously furnished. We were not asked to help in bearing the expense, so as a slight token of our appreciation we bought and had embroidered a new scarf for the altar, one end of which bears our name, the other the brothers'.

We had as guests on November 19th our worthy Grand President, Sister G. M. Sargent, and several sisters of Mt. Vernon Lodge of Washington. We were so glad to have them with us and hope they will come soon again.

We surprised our widowed sister with a pound party on Thanksgiving day, and are planning to do the same for the family of a sick brother on Christmas day.

We expect to recognize the birthday of each of our sisters in some way, beginning the first of the new year, and a committee has been appointed to frame our by-laws to go into effect the 1st of May, 1909.

Sisters, how many of us realize fully the responsibility we have taken upon ourselves both as individuals and as members of this noble society? Let us look back over the past year and make our reckoning. Have we done all that we could for the betterment of mankind? Is the world any better for our having lived? We may look back, but the past is gone; however, the future is before us, and let us make the year 1909 the best possible. Let us work together in peace and harmony, and be ever so thoughtful of the interests of our brothers that they may be ever grateful for such a society as the L. S. of the B. of L. F. and E. This selection from Bryant's "Thanatopsis" so often appeals to me:

"So live that when thy summons comes
to join
The innumerable caravan that moves
To that mysterious realm, where each
shall take
His chamber in the silent halls of death,
Thou go not like the quarry slave at
night
Scourged to his dungeon, but, sustained
and soothed
By an unfaltering trust, approach thy
grave
Like one who wraps the drapery of his
couch
About him, and lies down to pleasant
dreams."

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FROM L. S. 29—(*Mrs. Marguerite Bostic, Topeka, Kan.*) The second joint annual ball of the Flower of the West 205 and the L. S. 29 was held in Stemberg's Hall December 8, 1908. To say the least it was a social and financial success. There were seventy-five couples on the floor beside those who came to watch the good time.

A large number were present outside of railroad circles, due in a large measure to the patronage from the business men of the city, to whom we owe our surplus funds.

The best orchestra in the city was secured, and it was after 2 o'clock a. m. when the party broke up.

We think these balls are easy means toward swelling our treasury, besides the interest they create, and promote sociability among the railroad people and outsiders as well as ourselves.

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FROM L. S. 33—(*Myra Varble, Paducah, Ky.*) Heartease Lodge 33 has not made an appearance on these pages for so long a time that I suppose you have forgotten our existence. We are not dead, not even sleeping, but are quietly and surely plodding along.

We have not exercised our goat for a good while, but expect to use him in a few days, as we have an application on file.

On Hallowe'en we gave a pie social in our lodge rooms which was a success.

One afternoon each month we have a euchre party which is well patronized by our friends and keeps adding a little to our treasury.

The stork has visited three of our sisters in the past few months. Sisters Kelley's and Watson's homes were brightened by a dear little son and Sister Hart's by a dainty little daughter.

Wishing our dear Editress and all sisters and brothers a very happy and prosperous new year.

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FROM L. S. 74—(*Mrs. Hattie Baldner, Eagle Grove, Iowa.*) Since the beginning of the year we have initiated three candidates and have another application for our next meeting.

If we could get those who are eligible to membership interested we would have a fine field to work in and could very soon double our membership.

The homes of two of our sisters have been gladdened by the arrival of bright baby boys, namely, Sisters Johnson and Blackman.

On the afternoon of November 5th, after our regular meeting, our lodge served a fifteen-cent tea which added the neat little sum of ten dollars to our treasury. It is our intention of serving ten or fifteen-cent teas once a month during the remainder of the winter months.

At our first regular meeting in October we had the pleasure of listening to a very good report from our delegate, Sister Reider.

We meet the first and third Thursdays of each month. We gladly welcome all visiting sisters.

We all remember with pleasure the visit we received from the ladies of Headlight Lodge 16 of Boone, Iowa, last June. Just such meetings make us all more sisterly and do an amount of good for the Order.

With best wishes for all sister lodges for a happy and prosperous new year.

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FROM L. S. 91—(*Mrs. Mary Rishe, Mt. City Lodge 91, Altoona, Pa.*) We are prospering and ever busy and just getting ready to initiate two "brand" new members into our society, and we shall right soon be numbered among "the big ten."

On the evening of October 24th our society held a social at the home of Sister Makin, and we had as our guests sisters from Tyrone and Conemaugh.

Brother Shindler and the L. S. sisters surprised Sister Shindler on November 18th, it being her birthday, and it was a sure enough surprise. A delightful time was had and a dainty supper served.

On December 1st another very pretty surprise was successfully carried out on Sister Bookhammer. The sisters aided her in serving a fine supper, and at midnight all departed for their homes after having spent a most enjoyable evening.

December 3d a sauerkraut supper was our next attempt and was held at the home of our president, Sister Leonard. We cleared $24.

We donated $5 to the Railroad Men's Home.

Our next big event will be moving day, as we intend to move into the B. of L. F. and E. hall soon.

With best wishes for a prosperous new year to all.

* * *

FROM L. S. 98—(*Florence M. Lockwood, Los Angeles, Cal.*) I have been appointed correspondent and this is my first attempt, so trust there may be room for it. We have been very negligent the past year and have not been heard from through the Ladies Department for some time, but hope to do better in the future.

Last year was a very prosperous year, and will begin the new year by initiating a candidate and have several applications on file and expecting several more in the very near future.

The hardest problem we have to solve is to know what to do to get all of our members interested so that they will attend meetings regularly—but it seems most lodges have this same difficulty, so will tell you what we are planning on doing our next meeting and trust it may be of some assistance to others. After lodge meeting is closed we are going to have a card party and serve refreshments. Every member is allowed to invite their friends, and the small sum of ten cents will be charged for a score card, and the sisters donated the refreshments.

We have had some very pleasant times and are looking forward to some very enjoyable events before the winter is over.

Once a month we have a luncheon at the different sisters' homes and always have a nice time and plenty to eat.

We hold joint meetings once a quarter with the brothers, and the evening is spent in dancing and a banquet served afterwards, and there is where the brothers always show their good work and do ample justice to every good thing to eat.

New Year's was an ideal day and always is in "the land of sunshine and flowers," and that evening the boys gave their annual ball, the grand march starting at 9 p. m., led by Bro. George B. Fanan, president of Orange Grove No. 97, and his wife, Rose Fanan, president of Orange Blossom No. 98, and everything was vertainly a success. They secured the finest hall in the city, and it was decorated beautifully for the occasion, and an orchestra of twelve pieces.

We meet every second and fourth Tuesday and are always glad to welcome visitors.

I won't take up any more of your valuable space and will close with best wishes to all sister lodges.

* * *

FROM L. S. 53—(*Mrs. Edna Ashley, Trinidad, Col.*) I will turn over a new leaf by writing the Magazine a letter the beginning of 1909 and try to do better in the future than I have in the past.

We are getting along as usual, slowly. Have taken in one new member lately, but have had to drape our charter twice—once for our beloved sister warden, Florence Slaughter, and also Sister Spillane. This makes four members we have lost by death since our lodge was organized.

We have been having good attendance. The sisters seem to take more interest than formerly, which we hope will continue.

We gave a fancy bazaar just before Christmas and served coffee and cake. We made from this $4.85 and cleared on all $23.45, which helped to replenish our treasury.

* * *

FROM L. S. 168—(*Mrs. Ida B. Loucks, Livingston, Mont.*) No. 168 has been among the unheard for some time, but we have been pursuing very pleasantly and profitably our line of work.

You may ask are we alive? Well, I should say so—and very much alive. While we are but few in numbers, it is absolutely impossible for one to forget that it is meeting day—for we all have telephones and each one is phoned, with the result that there is a good attendance and good times and none can say that they forgot it was meeting day.

We have had an occasional new member and have two applications on file.

We had a very enjoyable joint meeting with the brothers last month (December). After the secret meeting a banquet was served and the remainder of the evening spent in playing games. We also planned for the New Year ball, the proceeds to be given to a sick brother who was one of our masters in days gone by and served the chair faithfully.

These functions given by the brothers each year have been very successful. We aim to have all become acquainted and have a good time, especially the "stranger that is within our gates."

We earnestly trust that we may have the privilege of greeting one of our Grand Officers some time soon.

How we do need a Y. M. C. A. parlors here for our boys—some place where they can go at will. 'Tis not always pleasant for them to stay in their boarding places if they have no homes, although there are many real "homey" boarding places here—yet a great many of them have only a room in a rooming house, and there are so many snares and pitfalls ready to grab them up, so it is necessary for us, the L. S., to do all we can, if only for a few hours of an evening, to entertain and have a place where the boys can spend a pleasant evening. My motto—

"Do all the good we can
As long as ever we can—
To all the people we can,
In all the ways we can."

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FROM L. S. 238—(*Alice M. Hollis, Portland, Me.*) Do not think because we have not been heard from that we are not in existence, for I assure you we are.

Our lodge has prospered very well financially during the past year. We have taken in two new members and have several more in view.

We have given one supper to the Great Eastern Lodge 4 and one social and dance from which we cleared fifty-five dollars.

A great deal of praise is due our committee who had charge of the dance, and special mention should be made of the chairman of the committee, Sister Glynn, who spent not only a great deal of her time but her money as well in order that the dance might be a success.

We are now planning an anniversary supper for the twenty-fifth of this month, it being our first birthday. We feel that we must celebrate it in some way.

Sister McGregor visited us in December and put us through the work of the lodge. She has promised us another visit in February.

With best wishes for a happy and prosperous new year to all and to our grand officers.

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FROM L. S. 113—(*Myrtle Shaul, Albany, N. Y.*) December 28th we held a joint meeting with the brothers of No. 230 in Cameron Hall, and it was very noticeable how the brothers enjoy these meetings by the large number in attendance. The evening was spent most pleasantly in listening to the following program:

Recitation, Master Harold Perlee.

Piano and violin selection by Miss Cora Perlee and Vincent Perlee.

Recitation and dance, little Miss Brinkman.

Choice selection by Miss Brider Housman and Mr. Housman.

Ladies of No. 113 gave their drill, which is always appreciated.

Refreshments were served, and all are looking forward with glad anticipations for the next joint meeting.

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FROM L. S. 70—(*Sister Hathway, Buffalo, N. Y.*) It has been a long time since we have heard from Holly Lodge, but we are still in the land of the living and doing good work.

On November 4, 1908, we gave a party which was a grand success.

December 16th we celebrated our twelfth anniversary. We had for our guests brothers and sisters from all of the other lodges in the city, and we spent a pleasant evening in cards and dancing. At a late hour all departed with best wishes and many happy returns.

Wishing all sisters and brothers a happy new year.

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FROM L. S. 51—(*Mary Platt, Denison, Tex.*) At this the beginning of another new year let us resolve to do everything in our power to do all that we can to make our L. S. the best in existence. Let us forgive and forget things that may have occurred to wound our feelings and live up to that grand old golden rule, "Do unto others as you would have others do unto you." Life is too short for us to remember the unpleasant things, and if we would but stop and realize that what we do and say in this life help to make up our future in the life to come, would we not conduct ourselves differently?

We all had a jolly good time Christmas and New Year's. Nos. 8 and 51 planned and carried out successfully a Christmas tree at the Fireman Hall. The committee—Brothers Platt, Lanter and Anderson, and Sisters Otto, Eggleston and Addams, this committee acting for both the Christmas entertainment and the watch party.

For the Christmas entertainment a fine program consisting of songs, recitations, etc., was given by the children. Bro. Bob Anderson acted as Santa Claus to the great enjoyment of the children, and came in like a true fireman—on time. There was a treat of candy and apples for all, and many presents placed on the tree by friends.

The New Year watch party was a success also. We had invited the brothers and sisters from Gainesville and Sherman, but the Gainesville lodge could not attend, but a nice delegation came from Sherman. The brothers had a four-piece orchestra to furnish music, and Sister Eggleston had charge of the program, which was much enjoyed. After the program supper was served, and such a supper, consisting of roast turkey, oyster dressing, cranberry sauce, celery, salads, pickles, sandwiches, home-made cakes, coffee, fruit. And after all had eaten all that they could we had one large turkey that had not been cut into, so we sold it for $2.60. After which dancing was indulged in until morning.

We all missed Sister Otto from our watch party, she being called to the bedside of her dying father on the 31st of December, and he passed away to a higher life on New Year's day. We all sympathize with our sister in her sorrow, as many of us know from sad experience what a great sorrow it is.

Wishing you all a happy, prosperous new year.

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FROM L. S. 211—(*Mrs. Annie Joyner.*) Hello, sisters. This is the new year 1909 and No. 211 is wideawake, and that is no mistake, as you'll see before I finish telling you what we are doing for our lodge. We are proud to tell it to some one, for we know what an enthusiastic band No. 211 is.

December 26th we were invited by brothers of No. 551 and held our third joint meeting. We favored the brothers with a Christmas supper and made those old, tired firemen who had been out on duty sixteen hours feel good. We have made it a rule to give the brothers a Christmas dinner each year, so they will be sure of one square meal during the year at least.

We started the new year with one candidate and read three applications. How many can say as much for their lodge? We would like to know how you started the new year.

We were invited to a watch party New Year's eve and a feast at Sister John Henry's and to welcome our new candidate, Sister Ora Henry, to our order.

We find it works like a charm to meet at each sister's home and spend a few hours, as our kind Editress instructed us to do. Try it, sisters, and see if it don't make you feel nearer and dearer to each other.

Our third annual ball was given November 24, 1908. It was a calico dress and overall ball. We found it to be the greatest ball of its kind ever given here and a complete success. Might try it, sisters, and see if it is not lots of fun.

Lodge 551 takes a great deal of interest in us, and we sure appreciate it and we hope always to merit their respect. We have good meetings and always serve something to eat and have jolly good times. We are only eighteen in number but hope to add many more during this year. Every member is a worker, not a drone, in the L. S. hive.

Wishing our kind Editress, Sister Strong, and all sisters a happy, prosperous 1909.

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Death Report.

Anna Hill, Lodge 103, died December 8, 1908; cause, tubercular laryngitis. Insurance, $200.

Hattie Spillane, Lodge 53, died December 13, 1908; cause, tuberculosis. Insurance, $200.

Emma Palen, Lodge 125, died January 3, 1909; cause, rupture of abscess of the appendix. Insurance, $200.

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Talk No. 3.

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(Continued from last Issue.)

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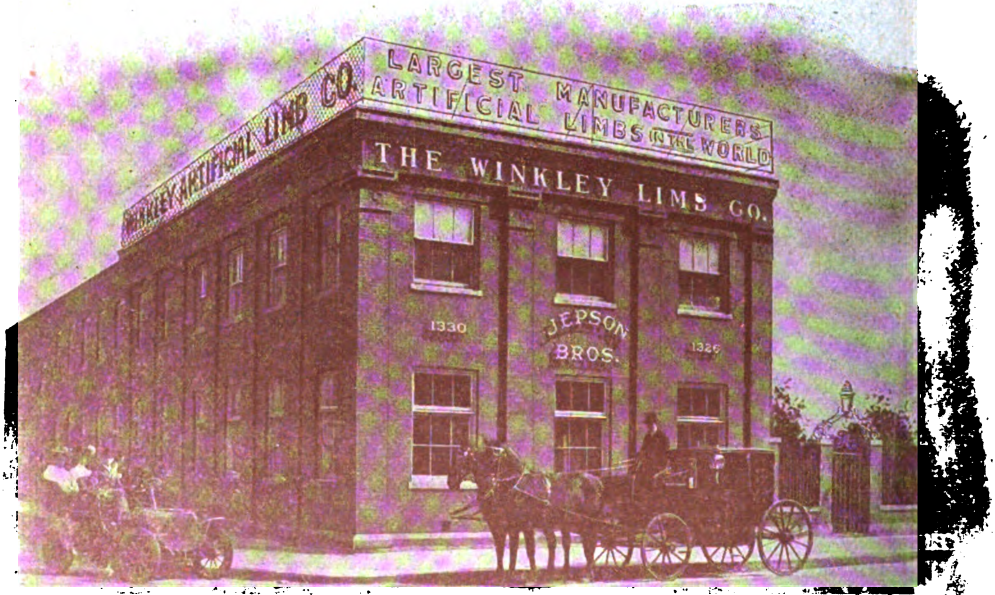
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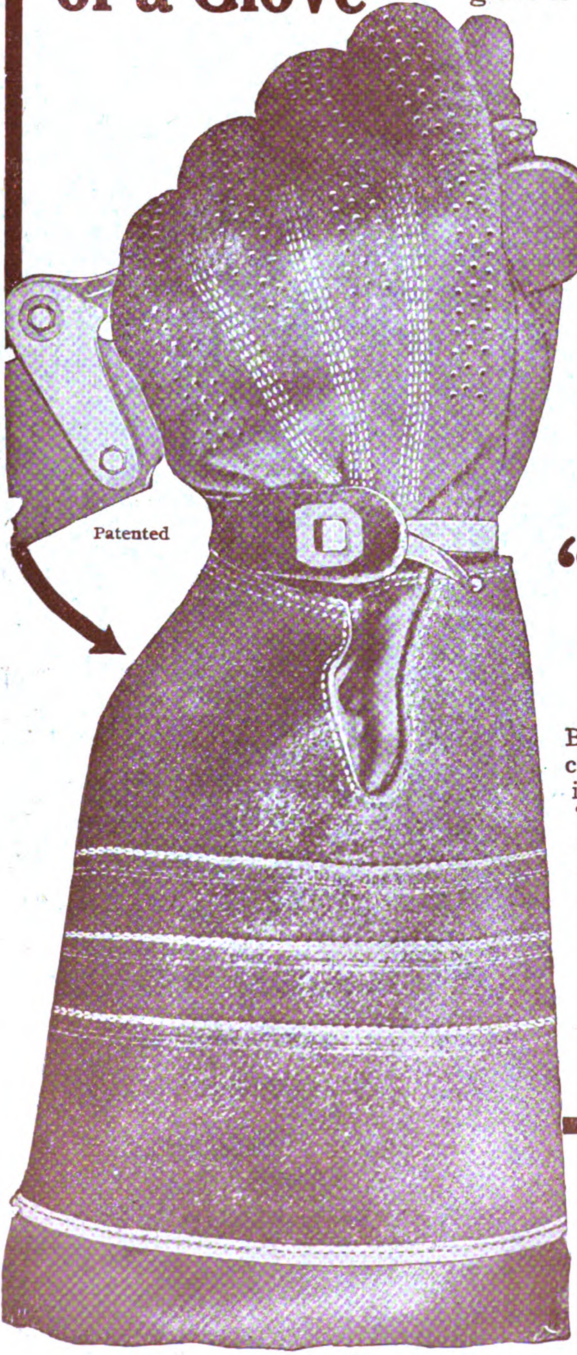

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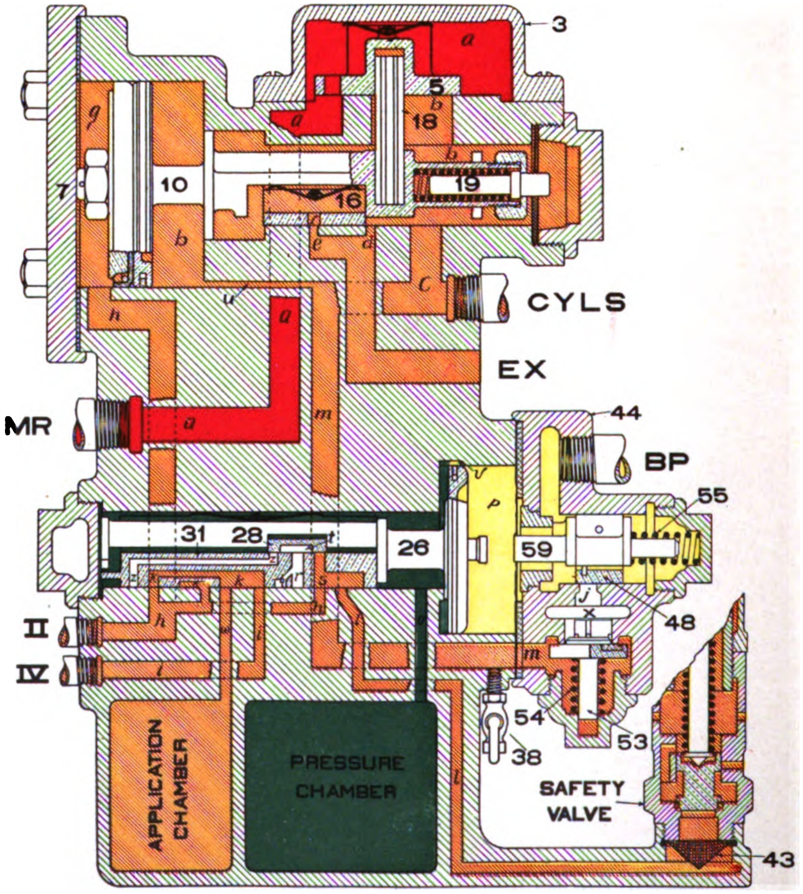

Locomotive Firemen and Enginemen's Magazine Educational Charts

WESTINGHOUSE AIR BRAKE SERIES

PLATE XLIII—DISTRIBUTING VALVE, WITH QUICK ACTION CYLINDER CAP, No. 6 ET LOCOMOTIVE BRAKE EQUIPMENT (Release Position)

BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

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Plate XLIII—Distributing Valve, with Quick-Action Cylinder Cap, No. 6 ET Locomotive Brake Equipment (Release Position).

Plate XLIII of the Westinghouse Air Brake Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts represents the No. 6 ET equipment distributing valve with Quick Action Cylinder Cap, in Release Position. In all of the preceding charts the No. 6 distributing valve has appeared of the same construction throughout, the differences being in the altered positions of the operating parts corresponding with the various phases of brake application, but, as the subject plate of this article, the distributing valve appears with an altogether different cap on the equalizing cylinder—the Quick Action Cylinder Cap, *44*. As already described, the equalizing portion of the distributing valve is comparable to a plain-automatic triple valve, while the substitution of the quick-action cylinder cap converts it to a type of quick-action triple valve, in that it vents brake-pipe air to the brake cylinders in an emergency application.

When this quick-action feature is not specified in ordering, the air-brake company supplies the No. 6 distributing valve with the plain, equalizing-cylinder cap, *23*; the quick-action cylinder cap ought, however, to form a standard part of the No. 6 ET equipment, for there is hardly a railroad in the country that does not double-head trains, occasionally at least, and with no automatically-acting, brake-pipe-pressure-venting mechanism between the engineer's brake valve of the forward engine and the quick-action triple valve on the first car in the train it is sometimes impossible for the head engineer to obtain an emergency application; and a failure to get quick action of the train brakes when the engineer's valve is placed in emergency position invariably causes a disastrous bunching effect on a long train, often resulting in the telescoping of cars, and the "buckling" of a whole section of the train that may be rounding a curve at the time.

The sudden, *smashing* stroke of the brake piston as the result of an emergency application of the ordinary quick-action triple valve is not undesirable with car brakes, and cannot be avoided, as the air vented from the brake pipe must equalize within the brake cylinder before the auxiliary reservoir pressure has time to shut it out; but the shock is considered too intense for driver brakes, and that is the reason why plain triple valves have always heretofore been used. With the quick-action feature of the No. 6 distributing valve, it is not necessary that the vent of brake-pipe air to the locomotive brake-cylinders shall be rapid enough to drive the brake pistons out with undue severity; it does not, and there can be no objections on that score.

The subsequent number of this Magazine will contain the color-plate charting the several parts of the distributing valve with quick-action cylinder cap, in the positions taken as the result of an emergency reduction of brake-pipe pressure, and an explanation in detail of that phase of operation. The chart in this number simply shows, as a new feature, the parts contained in the quick-action cylinder cap in their inactive positions assumed when the equalizing portion of the distributing valve is in release and charging (or charged) positions; in fact, both the application and the equalizing portions correspond exactly with their positions as shown in Plate XXXV in the August, 1908, number; the plates are wholly alike, with the one exception of the equalizing-cylinder caps.

It is presumed that the student of the No. 6 ET equipment, having followed the series of distributing valve charts through all the phases of regular operation so far, will not require any explanation of the present chart outside of the additions; and referring to Plate XLIII, these additions are—Quick Action Cylinder Cap *44*, and the operating parts within it, namely, *emergency slide-valve 48*, engaged between the shoulders of *emergency valve-stem 59*, and *emergency check-valve* and *spring 53* and *54*, respectively; the *graduating spring*, *55*, performs the same duty as does the more familiar one in the plain cylinder cap—of offering a resistance to the travel of equalizing-piston *26* during service reductions of brake-pipe pressure, and determining the service-application position to be taken by the equalizing portion of the distributing valve; but it also has the special duty of moving the emergency slide-valve to its closed position after an opening, and the opening force has receded.

Brake-pipe pressure enters the distributing valve through the quick-action cylinder cap at *BP*, filling the slide-valve chamber, as indicated by the yellow color, and, having forced equalizing-piston *26* to the release position as shown, begins the charging of the pressure chamber through feed-groove *u* as is understood. Consulting the lower portion of the quick-action cylinder cap it will become apparent why in all charts of the No. 6 distributing valve passage *m* in direct connection with the brake cylinders has existed, leading apparently nowhere,—ending in a "blind alley," a *cul de sac*, heretofore, blanked by the gasket of the plain, equalizing-cylinder cap; that passage is only intended for a possible connection with the quick-action cylinder cap, and provides the route from the emergency check-valve to the locomotive brake-cylinders; open, at present, to the atmosphere as the color would indicate, through the release ports of the application portion; the drain-cock, *38*, is for the purpose of draining off moisture from chamber *b* of the application portion, that may collect in passage *m*.

The chamber, *x*, and the port, *j*, in the interior of the quick-action cylinder cap contains no pressure above atmospheric, now, nor during any ordinary service application, as it is closed against brake-cylinder pressure by that pressure holding check-valve *53* to its seat—or, in the absence of air pressure, as at present, the check valve is held seated by the spring, *54*; and graduating-spring *55* holds slide-valve *48* over port *j* so that brake-pipe pressure cannot enter.

It is understood, of course, that the brake-pipe connection is not made directly with the quick-action cylinder cap, as shown, but connects with the reservoir section of the distributing valve as does the other four pipe lines that are shown, thereby permitting removal of either the cylinder cap or the whole valve section without disconnecting any pipe joints; the effect is just the same, however, as the pressures are ported through directly into the chambers or passages that show their entrance.

It should be remembered that at service applications the operation of the distributing valve is not affected by the quick-action cylinder cap in any way different from the influence of the plain, equalizing-cylinder cap, and in next month's number the chart representing an emergency application will make clear the operation of this quick-action feature and show the purpose for which it is intended.

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The Compound Locomotive.

A large number of compound locomotives have been converted into simple engines by different roads in the last few years, but the Chicago, Milwaukee & St. Paul has had such success with this class of locomotives that they have recently placed an order for a number of the Vauclain compound type.

It is strange to note that, while the compound is looked upon with disfavor on some roads, the Chicago, Milwaukee & St. Paul still continues to purchase more of them.

No doubt the difference in results obtained from this class of locomotives is due to local conditions, such as water, fuel and the manner in which the engines are handled by the roundhouse and shop staff. It cannot be claimed that the climatic conditions are responsible for the successful operation of these locomotives on the St. Paul road, since they are run through a country where the weather is very severe during the winter months.

The Atchison, Topeka & Santa Fe has placed an order for two passenger and two freight engines of the articulated compound type, which would indicate that it is not the compound locomotive, but the arrangement of the compounding that is being supplanted by that road.

The Mallet compound passenger engine is an unique feature in itself, but it is understood that these engines are to be fitted with feed water heaters, superheaters and reheaters as economizing features.

With locomotives of the Mallet articulated compound type it is possible to lengthen the boiler to a point far beyond that which would represent the best efficiency in the length of the tubes, where lateral clearance on curves is not a limiting element in the construction of the same. It is a well known fact that the greatest heating efficiency of the tubes is at the firebox end, and from that point to the smokebox it decreases at a rate more than directly proportional to the length of the tubes. It has not been considered good practice with any of the present-day fuels, including oil, to use a tube more than twenty feet in length. So the length of a boiler proper is limited in the case of the articulated compound by conditions arising within itself, and space created by possible increase in length can be used for other purposes. The increased length of boiler for the new Santa Fe engines is to be used for a secondary set of boiler tubes which act as feed water heaters. These tubes are located between heads about seven feet apart and a combustion chamber about eight feet long is left between the heads holding the ends of the two sets of tubes. This combustion chamber is to be used for a superheater or reheater, or both. Access to these inner boiler heads is to be gained by disconnecting the boiler or through a manhole.

The construction of these boilers would lead us to believe that these locomotives will not waste a great deal of the heat of the gases while passing through the tubes, and it may result in more perfect combustion from the use of the intermediate combustion chamber.

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General Lectures on Electrical Engineering.

The above is the title of a new book by Charles Proteus Steinmetz, A. M., Ph. D., consulting engineer of the General Electric Company and professor of electrical engineering in Union University. The book contains a series of lectures which were delivered by Professor Steinmetz, under the auspices of Union University, in the winter of 1907-8, to a class of younger engineers, consisting mainly of college graduates. They are general in their nature and deal with the problems of generation, control, transmission, distribution and utilization of electric energy, treating of the operation of electric systems and apparatus under normal and abnormal conditions, and of the design of such systems; but the design of apparatus is discussed only sufficiently as is necessary for an understanding of their operation, and so be enabled to judge of their proper field of application.

The subjects have been treated in a very simple and intelligible manner, and the lectures, as edited for publication, are remarkably free from mathematics and complicated formula, having been made equally available to a large class of students and others seeking knowledge but who are not familiar with mathematics, without in any way decreasing their value to the engineer who has received a college training.

The lectures give a broad review of the entire field of electrical power generation, transmission, distribution, control and use, showing the close relation and dependence upon each other of all the factors of the problem. There are seventeen lectures, embracing the subjects of general distribution, light and power distribution, load factor and cost of power, long distance transmission, higher harmonics of the generator wave, high frequency oscillations and surges, generation, hunting of synchronous machines, regulation and control, lightning protection, electric railway, motor characteristics, alternating current railway motor, electrochemistry, the incandescent lamp, and arc lighting. Following the lectures are two appendixes. Appendix I treats of light and illumination, and consists of a paper which was read before the Illuminating Engineering Society, December 14, 1906, and revised to date. Appendix II treats of lightning and lightning protection, which was a paper read before the annual convention of the National Electric Light Association, 1907, and revised to date.

The book contains 284 pages, 6 by 9 inches, 48 illustrative diagrams, and a portrait frontispiece of Dr. Steinmetz in photogravure, hand tinted. It is nicely bound in cloth, with gilt top. Price $2 net, postpaid. Published by Robson & Adee, Schenectady, N. Y., to whom orders should be addressed.

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Bureau for the Safe Transportation of Explosives and Other Dangerous Articles.

The report of the chief inspector of the Bureau for the Safe Transportation of Explosives and Other Dangerous Articles for the calendar year 1908 has been issued. A summary of the work of the Bureau for the period covered by the report is as follows:

Total number of lines, members of the Bureau (January 1, 1909) was 158, which included a mileage of 202,186. Total number of inspections of explosive stations, 5,603. Number of explosive stations receiving two or more inspections, 1,309. Total number of inspections of inflammable stations, October 15, 1908, to January 1, 1909, 1,908. Total number of inspections of factories, 270. Number of factories receiving two or more inspections, 69. Total number of inspections of magazines, 1,540. Number of magazines receiving two or more inspections, 361. Number of discoveries of dangerous lots of explosives whose shipment by rail was prevented, 197. *Total number of boxes of high explosives condemned as unsafe for transportation, 4,852.* Total number of cars containing explosives inspected, 448. Total number of inspections made by Bureau, January 1, 1908, to January 1, 1909, 8,959. Total number of lectures to railway officials and employes and meetings addressed on the subject of the regulations, 171. Number of accidents, explosions and fires reported: in manufacture, storage, etc., 84; in transportation by rail, 79. Total known property loss account of explosions or accidents in transporting explosives by rail, January 1, 1908, to January 1, 1909, $114,629. *Decrease over previous calendar year, $382,191.* During 1908 the total known number of persons injured was 53, a decrease of 27 over the previous year, while the total known number of persons killed was 26, just half the number killed the previous year. At the chemical laboratory 778 samples of black powder, smokeless powder, high explosives, fireworks and inflammables were received during the year. During the same period reports were rendered to the chief inspector on 542 samples of high explosives, smokeless powder, fireworks and inflammables.

The report is very complete, and contains appendixes giving reports from the chemical laboratory, educational work, address of chief inspector to National Association of Railway Commissioners, address of chief inspector concerning shipments of inflammable articles and acids, delivered before the Railway Club at Pittsburg, Pa.; general instructions for local inspectors, general information for local inspectors and railroad employes, personnel of the Bureau, assignment of local inspectors, list of manufacturers of explosives, and members of the Bureau of Explosives.

Copies of the report may be purchased from the Bureau of Explosives, 24 Park Place, New York, N. Y., at $1.00 per copy.

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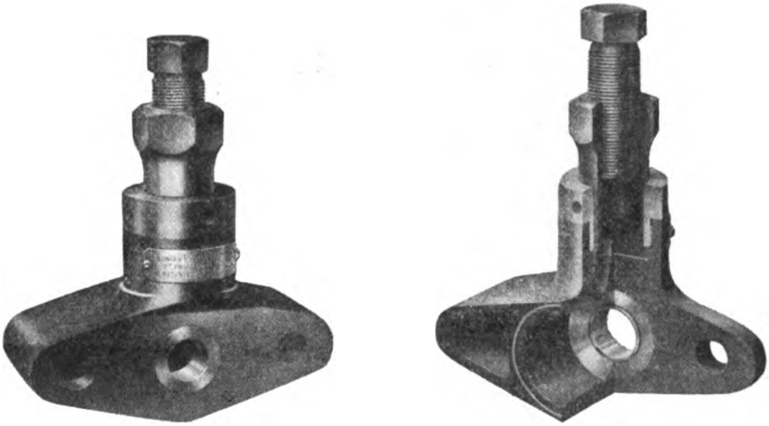
D. & L. Throttle Rod Stuffing Boxes and Plunger Plastic Packing.

A new design of throttle rod stuffing box which is believed to be a vast improvement over existing designs in general use, and affording a new and better method of packing throttles, is called the D. & L. stuffing box, illustrations of which are shown herewith. With it is used a plastic packing which is claimed to be absolutely leak proof and which can be applied with full pressure in the boiler, something which is impossible with the stuffing boxes in general use. It will be seen from the illustrations that it can be readily attached to any locomotive without any change in the throttle rod, connections or stuffing boxes now in use. For new power or for old power with odd design of throttle rigging the manufacturers furnish specially designed D. & L. stuffing boxes, and state that the design here shown is applicable to 90 per cent. of the locomotives now in service. In applying to new power the heavy brass stuffing box generally used is dispensed with, the saving in that respect partially paying for the D. & L. equipment. It presents a neat appearance upon the boiler head, and two years' use on locomotives in switching and freight service has demonstrated its simplicity, economy and safety. Among the chief points of advantage claimed for the D. & L. stuffing box are:

Adaptability to old as well as new power without any change in throttle rod or connections. Saving of time required to pack throttle, both in labor and not having to take engine out of service. Engineer can carry packing in the seat box and pack throttle when necessary. Throttle handles 50 per cent. easier than with other throttle packings. Long life of packing due to thorough lubrication. Cheapness of packing; from 25 to 125 per cent. cheaper than standard packing now on the market. Minimum wear upon throttle rod. The complete avoidance of delays to motive power that are caused by an occasional oversight of the condition of the throttle packing. One size packing for all size throttle rods.

The following directions are given by the manufacturers for applying the D. & L. stuffing box:

"Remove gland and packing from stuffing box and clean stuffing box so the copper gasket on the D. & L. stuffing box will make a good joint. Bore out front and back throat rings so they fit the throttle rod nicely and press front throat ring to the bottom of the front stuffing box (it should be about 1/32 smaller than the bore of the stuffing box so as to be easily forced to the bottom). The back throat ring should be a snug fit for the D. & L. stuffing box and forced to the bottom of the bore.



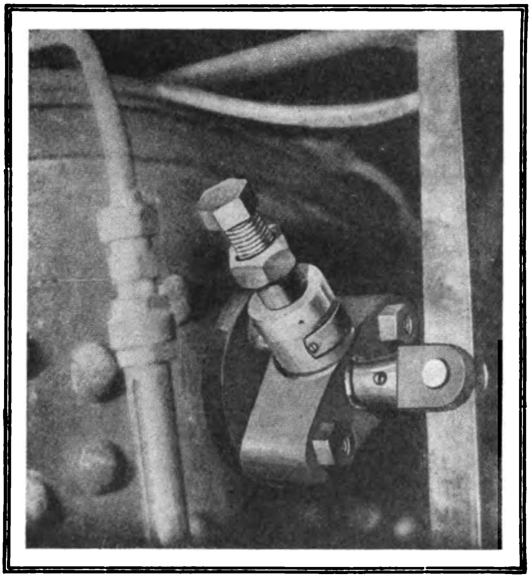
The D. & L. Throttle Rod Stuffing Box

"The D. & L. stuffing box is then slipped on in place and the nuts put on the studs with the fingers. Work the throttle lever a few times to be sure the throat rings do not bind the rod and tighten the nuts with a wrench. The stuffing box is now ready for filling with the plastic packing."

The plunger packing is put up in tubes, four tubes in a box. One tube is said to fill the storage chamber and may be applied in a few minutes, with steam on the boiler, and will last from four months to a year. The tubes being sealed and put up in a strong box, they can be carried in the seat box and at hand when needed.

The directions for applying the plastic packing are as follows:

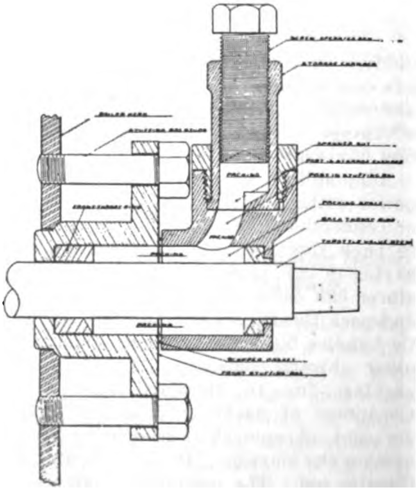
"In packing the D. & L. stuffing box for the first time, the engine must be 'dead.' In repacking, it makes no dif-



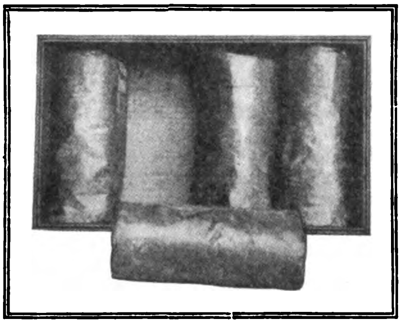
The D. & L. Throttle Rod Stuffing Box Applied to Boiler Head of Locomotive

ference whether live or dead. To pack, with the hand or a light wrench, turn storage chamber to the left about one-half turn to closed position (marked on side of spanner nut and storage chamber). It cannot be turned too far, as a stop pin will prevent it. Next remove screw-operated ram and insert one tube of the plastic packing; replace ram and screw down about three or four turns; with wrench turn storage chamber to the right to open position and then screw down ram to the bottom. Repeat operation until enough packing has been forced into the stuffing box to fill it (about four tubes will fill an ordinary stuffing box). Refill'the storage chamber and the throttle rod is ready for service. It is well to drop in about a teaspoonful of valve oil each time the storage chamber is refilled, and by putting in a little oil about once a month you will keep the throttle packing well lubricated, and as a consequence have an easy working throttle and prolong the life of the packing.

"The screw-operated ram should be screwed down occasionally to take up the wear on the packing or when packing shows sign of a leak. For a few hours after being packed for the first time the packing will leak a little oil and water, and some of the lighter ingredients of the packing will work out around the rod. Do not be alarmed, as this will stop after being in service a few hours. When engine is fired up the first time after packing, the screw-operated ram should be screwed down a little as the pressure increases. *Caution.*—Before removing



The D. & L. Throttle Rod Stuffing Box—Sectional View screw-operated ram be sure to turn storage chamber to closed position, thereby closing the port leading into the stuffing box. After replacing screw-operated ram be sure to turn storage chamber to open position so the packing can pass into the stuffing box. Do not force the screw-operated ram too hard, as very little pressure is required (a wrench with a six-inch handle is plenty large enough). Remember that a one-half turn of the storage chamber is enough to close or open the port."



Plunger Plastic Packing put up in Tubes. Four Tubes in a Box

The D. & L. throttle rod stuffing boxes and plunger plastic packing are manufactured by the Plunger Plastic Packing Company, St. Paul, Minn.

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The Block Signal and Train Control Board.[*]

This board was appointed on July 10, 1907, and organized on July 12. The doings of the board during the year 1907 were made the subject of an informal report to the commission November 21, 1907.

The duties of the board, as defined by its instructions from the commission and the acts of Congress under which its appointment was authorized, embraces the investigation of (*a*) block signals, (*b*) automatic stops and cab signals, and (*c*) other devices designed to promote the safety of railroad operation. According to the terms of the law the board may investigate the "use of" and the "need for" devices which come within these definitions and may test devices and appliances which are presented to it "in completed shape * * * without cost to the government."

The two subjects first mentioned (*a* and *b*) were investigated by the commission before the appointment of this board, and the report on the subject made by the commission to Congress February 23, 1907, may be looked upon as a preface or explanatory introduction to the work of this board. In that report the commission gave a succinct account of the state of the art of block signaling in the United States at that time and recommended the enactment by Congress of legislation looking to the gradual compulsory adoption of the block system on all passenger lines, except those traversed by less than six trains each way weekly. This recommendation made by the commission in 1907 (a repetition of recommendations made in former years) was indorsed by this board in its informal report of one year ago.

Block signals, both automatic and non-automatic, have already been intelligently developed in this country, and the time of the board has therefore been devoted mainly to automatic stops and cab signals, which have not been so fully developed. Up to November 21, 1907, the date of our former report, about 250 plans of inventions in this field had been received, and 55 of these had been examined. Nearly all of these inventions were found to possess little or no merit, the inventors being apparently unfamiliar with the needs of the railroad service as well as ignorant of the state of the art. The makers of those automatic stops and cab signals which are in regular use have taken no special pains to bring their apparatus to the attention of the board, though they have offered to furnish any information which we may ask for.

Within the past twelve months a further large number of descriptions of inventions, alleged inventions, or propositions has been received, and they have been dealt with as shown in the statement given below.

The authority to investigate devices other than block signals, automatic stops and cab signals was granted by Congress May 27, 1908, and as yet has been exercised only in a small number of cases, none of which calls for notice in this report.

The present status of the work of the board may therefore be said to be as follows:

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[*] Extracts from first annual report of the Block Signal and Train Control Board to the Interstate Commerce Commission, dated November 20, 1908.

Plans and specifications of 371 devices have been examined to date. Of these, 248 relate to block signal, cab signal, or automatic train stopping devices, while 123 relate to other devices designed to promote the safety of railway operation, as defined by the provisions of the Sundry Civil Appropriation Act of the first session of the Sixtieth Congress.

Of the 371 files placed under examination, 184 have been reported on, and 187 are still in course of examination.

Of the 184 files reported on, 168 are signal and train stopping devices, and 16 are other railway safety devices.

Of the 187 files still in course of examination, 80 are signal and train stopping devices, and 107 are other safety devices.

Of the 184 files reported on, 12 signal and train stopping devices have been considered to possess sufficient merit to warrant the board in saying that if the proprietors should install the same on a railroad under practical working conditions the board would examine the installations with a view to determining whether tests should be conducted at government expense. Of these 12 devices, 4 are now being installed, 1 of these being reported ready for test, and the board is advised that the installation of 4 others will be begun in the near future.

It has been necessary to spend much time on some of the most ill-considered inventions, for in rejecting a device or plan, cherished by its originator as promising great benefits to mankind and vouched for by patent experts as unique, it is necessary to marshal the reasons for our action in the most logical and forcible manner. Such inventors often are exceedingly persistent, and some of them, sorely disappointed at the unfavorable decision of the board, return again and again.

Statistics.

Under an order issued by the commission on November 18, 1907, the board gathered and compiled statistics showing the mileage of railroad operated by the block system in the United States as of January 1, 1908, together with information as to the kinds of apparatus used for automatic block signaling and of the methods employed in the working of the non-automatic block system, and these were published by the commission in pamphlet form in April last. By direction of the board, the secretary has distributed 1,500 copies of this pamphlet. Under an order which has just been issued by the commission, it is proposed to compile similar statistics as of January 1, 1909. These statistics give no information concerning automatic stops, because until within a few months there have been none of these in use on railroads which are subject to federal authority in this matter. (Automatic stops are in use on the Hudson and Manhattan tunnel between New York, N. Y., and Hoboken, N. J.) No information is given concerning cab signals, because none of these are in regular use in this country.

The work of the board during the past twelve months has been pursued along the same lines as before, but in addition to investigations in this country two members of the board, in March last, visited England, France and Belgium to secure information concerning the use of cab signals in those countries.

To expedite the work of the board three technical assistants have been employed to aid the members in digesting descriptions with a view to reaching decisions on all important matters at the earliest possible date.

Procedure.

Inventions and propositions brought before the board are dealt with in accordance with the procedure prescribed last year and referred to in our former report. It is required that each invention be suitably described, with drawings if necessary, and as a rule these drawings and descriptions must be examined and passed upon by the board before the question of testing a device will be taken up, and before hearings or interviews will be given. When the plan of a device has been examined and the thing described is held to have merit, the board, if satisfied that a test would be of value or interest to the public, advises the proprietor that if an installation, made by himself, when tested by himself, confirms the favorable impressions given by the plans, the board will undertake a test on behalf of the government. As the commission has already been informed, the American Railway Association has co-operated with the board in securing the use of tracks for testing automatic stops and cab signals.

In carrying out the intent of the legislation under which it acts, which requires investigation of the use of and necessity for apparatus and systems for the promotion of safety in railway operation, the board not only examines plans, descriptions, models or installations of devices submitted to it, but makes such observation and inspection through its members or employes, regarding the use of existing appliances, systems and operating methods, as may enable it to determine the necessity for other appliances, systems or methods than those now in use.

The principal appliances or systems, the use of and necessity for which have been considered by the board up to the present time, are the following:

1. Automatic stops.
2. Cab signals.
3. The telegraph block system.
4. The controlled manual block system.
5. Automatic block system.
6. Other railroad appliances and systems.

1. *Automatic stops.*—This term is used to define devices for stopping railroad trains by means independent of the engineman or motorman. The class may be divided as follows:

(*a*) Contact devices, mechanical, on or near the ground. At a fixed point, as at the entrance to a block section, a lever on the engine or a car of a train, coming in contact with apparatus fixed on the roadway, actuates levers, valves, etc., on the vehicle. No electrical apparatus is used.

(*b*) Contact rail devices for conveying an electric impulse from a fixed point on the roadway to an electrical apparatus on the vehicle. A rail (or rails) fixed at the signaling point, or in a suitable relation to it (but not continuous throughout the length of the block section), comes in contact with a metallic brush or other conductor on the vehicle.

(*c*) Ground devices embracing both of the foregoing features.

(*d*) Devices for making contact overhead, as, for example, from a signal post to apparatus fixed on the roof of the cab of a locomotive, mechanical, electrical, or both.

(*e*) Devices making no contact, the impulse on the vehicle being produced by magnetic or electric induction.

2. *Cab signals.*—These may be classified *a*, *b*, *c*, *d*, *e*, the same as automatic stops, the difference being that automatic stops are designed to shut off steam or cut off electric power and apply the power brakes, or both, while a cab signal is designed only to ring a bell or sound a whistle or show a light for the information and guidance of the engineman or motorman, these audible and visual signals being given in his cab.

3. *Telegraph block system.*—With this system three principal methods of communication are used; *a*, Morse telegraph; *b*, telephone, and *c*, electric bells (with code). While in the operation of most systems of this kind communication between the signalmen at both ends of the block is prescribed to admit a train to the block, systems are in use on the Erie and on the Northern Pacific in which the operations of the block signalmen are actively participated in by the train dispatcher, who supervises the movement of trains under the block signal rules throughout a division or subdivision of a railroad.

4. *Controlled manual block system.*—In this system, which is further described under a separate heading, four principal methods of control are used: *a*, block instruments without track circuits; *b*, block instruments with track circuits or track instruments at each block station; *c*, block instruments with track circuits throughout the length of each block section; and *d*, the electric train staff.

5. *Automatic block systems.*—In practically all such systems in use in this country the operations of the signals are controlled entirelv by the action of the train upon track circuits throughout the length of each block section or by certain conditions affecting the use of the block, such as the continuity of the track rails and the position of switches. In such systems the signals proper are classified as follows: *a*, exposed-disk or clockwork signals; *b*, inclosed-disk signals; *c*, electro-pneumatic semaphore signals; *d*, electric-motor semaphore signals; *e*, electro-gas semaphore signals; *f*, "light" signals; and *g*, other types. Such systems comprise a considerable amount of other apparatus, such as relays, circuit controllers, generators, compressors, motors, batteries, and a large number of other electrical and mechanical devices.

6. *Other railroad appliances and systems.*—This class includes the following devices: *a*, roadway and structures, including rails, ties, switches, rail fastenings and other track appliances, bridges and other structures and permanent way appliances; *b*, equipment, including locomotive, motor and car structures and machinery, such as trucks, wheels, car steps

and platforms, brakes and brake rigging, draft rigging, car couplers, hose couplers, and car appurtenances; *c*, train signals; and *d*, operating systems and methods.

Automatic Stops and Cab Signals.

The automatic stops and cab signals now in use are few in number and do not call for extensive investigation, for their characteristics are known. Most of them are installed in situations free from the troubles incident to frost, snowstorms and certain other adverse conditions which prevail on railroads generally.

Carrying out what we believe to be the purpose of the resolution of Congress, the object kept in view by this board in this matter is the securing of accurate information concerning the usefulness and efficiency of automatic stops in general railroad service. Experience with stops in subways or in other places not exposed to snow, rain and frost does not afford the lessons sought, and therefore the board is devoting its attention chiefly to such devices as are offered for test in unprotected situations during the winter season. Experience on city passenger railroads is unsatisfactory also because of the absence of some of the conditions which must be met on ordinary railroads; such as irregularity in the length of trains and differences in design of engines and cars; also because in consequence of the very heavy traffic on those lines very frequent inspection is practicable. On ordinary railroads such highly efficient inspection would probably be excessively costly.

Automatic stops.—The principal automatic stop devices which have had our attention are as follows: The mechanical trip devices used in connection with electro-pneumatic block systems in use on the Boston elevated, the Interborough Rapid Transit of New York City (subway), the Philadelphia Rapid Transit, and the underground lines in London, England. Mechanical trip train stops of the same general design, but worked by electric motors rather than by compressed air, are in use on the Hudson and Manhattan tunnel under the Hudson River between New York, N. Y., and Hoboken, N. J. The officers of these roads are unanimous in their testimony as to the satisfactory operation of the stops, and there have been occasions when, but for the action of the automatic stop, collisions would have occurred in consequence of neglect on the part of the motormen.

Two experimental installations of automatic stops have been made recently, one of the mechanical trip type, with certain modifications, by the Rowell-Potter Safety Stop Company, on the Chicago, Burlington and Quincy Railroad near Chicago, and one of the intermittent contact rail type, with a normally closed engine circuit, by the Simmen Automatic Railway Signal Company, of Los Angeles, on the Atchison, Topeka and Santa Fe Railroad in southern California.

The Rowell-Potter Company has been before the public for fifteen years or more, and devices made by it have been in use in past years to some extent, notably by the elevated roads of Chicago, but the apparatus now installed on the Chicago, Burlington and Quincy has been tried but a short time, and the board is not yet prepared to report on it. The Simmen devices include a system of remote control of a number of signals in a block system from a central point, such as a dispatcher's office. This installation also has been in use but a short time, and no detailed investigation of it has been made.

The board has made a partial test of the Perry-Prentice cab-signal and train-stop device as recently installed experimentally on the line of the Suburban Railroad Company of Chicago. This system forms, so far as known, the first application of the use of the Hertzian waves to railroad signaling. It makes use of "wireless" communication between a line wire strung along the track and apparatus in the engine cab. A coherer is included in a normally closed engine circuit, which circuit is broken if the particles of metal in the coherer cease to be held in cohesion by the action of the Hertzian oscillations emanating from the aerial conductor extending through the block.

Cab signals.—While, as previously noted, a number of installations of automatic train stops have been made on certain city railroads in this country, none of these installations provide for a visible or an audible signal indication on the vehicle. The automatic stops are used in connection with fixed visual signals only, it being generally assumed by the officers of these roads that it is unnecessary to supplement the indication of the fixed signals with any indication on the vehicle, and that the motorman, guided by the fixed signal indications, will properly control his train under all conditions except those which incapacitate him for proper action, in which event the automatic stop will come into play and control the movement of the train.

On the other hand, the European idea seems to be that if a sufficiently clear and reliable indication is given to the engineman he can be depended upon properly to control his train; and therefore automatic stopping devices are not favored. Most of the descriptions of automatic train-stop devices submitted, however, provide for the use of a cab signal; and some cab-signal devices have been presented which do not include the use of an automatic train stop. The immediate problem in either of these devices is to produce certain effects on apparatus carried on the vehicle by the existence of certain conditions upon the track, and if the apparatus or system provides a proper means for carrying out this object the means are equally available for the control of an automatic train-stop or cab-signal or other device of that character fixed on the vehicle.

The only cab signals which have been used regularly for any considerable length of time are: (1) That used on the Northern Railroad of France; and (2) that on the Northeastern Railroad of England. That on the Northern of France is an electric contact apparatus (class 2 *b*). It is used in connection with fixed manual visual signals throughout the lines of that company, over 2,400 miles in extent, and has been so used on most of those lines for twenty years. A whistle is sounded in the cab of the locomotive when a fixed distant (visual) signal is passed at "caution." The system cannot be approved, however, because the electric apparatus is arranged on the open-circuit principle. As the silence of the whistle in the cab indicates a clear track, any derangement of the apparatus, for example the accidental breakage of a wire, would produce a false clear indication. The apparatus being arranged on this principle, there is no way of knowing with exactness how well it has served its purpose, for it may have been out of order an unknown number of times without being promptly discovered.

The board has communicated with the officers of the Northern Railroad of France, but their experience is relatively of little value as throwing light on the problems which have to be met in this country, because of the open-circuit feature and because in the climate of France the apparatus is not subject to severe weather conditions.

The cab signal on the Northeastern of England is a mechanical arrangement (class 2 *a*), and it has been in limited use for ten years. Like the electric device just mentioned, however, it gives no warning of its own failure, and therefore the records of its service are of little value as throwing light on the degree of perfection with which it has worked.

A cab signal combining the functions of both classes—2 *a* and 2*b*—but operated on the closed-circuit principle, is in use on the Great Western Railway of England, where it has been in regular service on a short branch line for over a year. This apparatus gives proceed indications as well as caution indications, and the board of trade has permitted the abandonment of the fixed distant block signals where this system is in use.

A cab signal actuated by magnetic induction was tried on the Manchester, Sheffield and Lincolnshire several years ago, and with good results, but the experiment was given up because, in consequence of the number of foreign locomotives running over the line, the company concluded that no cab signal of any kind would be desirable.

It will be observed that automatic stops are in use in America, but not elsewhere, except on the London underground lines. Cab signals, on the other hand, are in use in England and France, but not at all in America.

Comparison of automatic stops and cab signals.—In considering the characteristics and use of automatic stops as compared with cab signals, we have the following facts:

1. Automatic stops have been adopted for regular service only on city railroads which carry a heavy traffic and are worked by electric power. Their lines are in tunnels protected from snow, or on elevated structures where snow does not accumulate in troublesome quantities. Motormen do not have a companion or monitor in the cab with them, as does the engineman of a steam locomotive, and there is therefore a stronger argument for an automatic stop. Being worked under exacting conditions, these city roads are very efficiently inspected.

2. The Northern of France uses cab signals, but it does not get from them the full benefit of which they are capable, and therefore France must be left out of the account.

3. Leaving out facts 1 and 2, both automatic stops and cab signals are to be looked upon as still in the experimental stage, although they have been proposed for many years. Cab signals have been tried in many places, but all of the experiments have been short-lived, except that on the Northeastern of England. British railroad officers naturally prefer a cab signal, because, with the high efficiency of their locomotive runners, they do not feel the need of an automatic stop. They have more trouble from fog than is experienced in America, and therefore feel a more definite need of a cab signal for use as a convenience in ordinary working, regardless of the question of safety. In America both cab signals and automatic stops have been proposed as safety devices purely, and on the assumption that the vigilance of enginemen and motormen cannot be improved to the point of insuring a satisfactory degree of safety while using only the present visual signals.

Telegraph Block System.

In connection with the falling off in freight traffic throughout the country since the beginning of the depression in business in October, 1907, some roads have carried their economies so far as to discontinue the use of the block system where it had been regularly maintained for some years; and this expedient is reported to have been adopted on two single-track lines where the controlled manual system (without track circuits) has been in use several years. Again, on lines where the block system is still maintained a part of the block stations have been closed to save the expense of maintaining signalmen both night and day. In still other cases a part of the block stations on a line have been put under new schedules under which they are closed a part of the time; as, for example, an office will be closed eight hours out of twenty-four, thus saving the expense of one signalman. In some cases an office will be kept open in the daytime and not at night, while perhaps at the next station no signalman will be found on duty in the daytime, but one will be on duty at night. Other odd arrangements or hours have been introduced. These irregularities have been introduced not alone because of the depression in business, but also because of the law enacted by Congress March 4, 1907, limiting the hours of service of block signalmen, which increases the expense. As business improves the block system will be restored probably; but this making of extensive changes in the methods of train operation by so many roads emphasizes the importance of the bill which was before the last Congress to authorize the Interstate Commerce Commission to secure full information regularly concerning this department of railroad operation. This feature of the bill introduced by Hon. J. J. Esch, of Wisconsin, in the last session of the Fifty-ninth Congress is no less important than that making the use of the block system compulsory.

As was remarked in the report of the commission on the block system in February, 1907, many block signalmen in America are young and lacking in training and experience. This has been indicated in the records of railroad accidents, this deficiency being a cause of disastrous collisions. This fault in the personnel of railroad operation has not been so conspicuous during the past year as it was during the heavy traffic of 1905-1907, because, first, the diminished number of trains has made the work of the signalman simpler and easier, and, second, the same cause has made possible the improvement of the block-signal service by eliminating the less competent signalmen. This improvement in the personnel has not been universal, however, and the board has information of instances here and there of signalmen whose incompetence was manifest, and in some of these cases there has been evidence of excessive use of intoxicants. The information the board has gained as the result of the investigation it has conducted along these lines justifies the continuance of this investigation.

While on the subject of the personnel of telegraph offices it is proper to observe that the difference in habit, capacity and training of signalmen on the railroads of Great Britain as compared with those of American roads, which was referred to in the above mentioned report, was confirmed by the observations of members of this board in England and Scotland last spring.

Under the head of the telegraph block system, mention should be made of the superiority of the block telegraph instruments used in England—which are modifications of the well-known needle telegraph—as compared with the communicating methods used with the simple manual or telegraph block system in this country. With the needle system the receiving instrument gives a visual as well as an audible signal, and the visual part, by the position in which it remains after each operation, serves as a constant indication before the signalman's eyes of what the last operation was.

A modification of the telegraph block system has lately been introduced on the Northern Pacific Railway—single track—which merits attention. This is the simple telegraph block system, but each operation by the signalman—or, rather, the series of operations by which a signalman assures himself that a block section is unoccupied and then gives the proceed signal to a train—is carried out under the immediate supervision of the train dispatcher, all the block signal stations of a district being on a single wire connected with the dispatcher's office. This system is commonly called the "A B C" system. A train is admitted to a block section only on a signal in which the dispatcher and two block signalmen have co-operated, thus greatly reducing the chances of error. The operations are further safeguarded by requiring each train to stop at every station, unless the signalman both displays a clear signal and delivers written cards to the enginemen and the conductor. (By means of large hoops these cards are delivered to trains passing at 25 miles an hour and faster.) By the employment of these safeguards provision against collisions of trains is so fully secured that the officers of the road have felt warranted in the discontinuance of the rule requiring all meeting orders to be written out, telegraphed, repeated and receipted for. This writing and repeating process is so slow that it causes many delays to trains.

On some divisions of the Northern Pacific the freight trains are now run over the road in 20 to 25 per cent. less time than formerly. This not only effects an economy for the road, but also enables the trainmen to earn more wages per hour. The arrangement of meeting points without using the full written and repeated telegraphic orders is equally practicable with the electric train staff, and the same saving in time is accomplished. This is shown by the results on those parts of the Southern Pacific and the Atchison, Topeka and Santa Fe where the train staff is used. The difference in the Northern Pacific practice as compared with the use of the staff system is that the method under which the dispatcher co-operates with the signalman may be introduced on any line, no matter how light its traffic, and with but little preparation; and the cost of the electric staff apparatus, which is considerable, is saved. On the other hand, the number of dispatchers may have to be increased, and the maintenance of the discipline necessary to make the three-man block signaling operation satisfactorily free from liability to error is probably more of a task than the maintenance of the same degree of safety by means of the electric staff, which is a highly efficient "controlled manual" apparatus for single-track lines. As a preventive of false clear block signals, this apparatus theoretically should be superior to any number of co-operating men.

The term "telegraph block system" as used on American railroads is applied to all man-operated systems not fitted with electric control of levers, and includes lines where the telephone is the means of communication. Telephones have been used to a limited extent for several years for sending train orders. They have lately been introduced quite extensively in block signaling, however, as was shown by the block signal statistics published by the commission in the present year.

Theoretically, telephones are as safe and as convenient as the long-used Morse telegraph, and the experience of many roads for the last year or two has confirmed this theory. We touch upon this subject in this place merely to make reply to the query, voiced in several places, whether the change in apparatus and methods has involved any lessening of safety. The only serious question that has ever been raised concerning the safety of telephones is in regard to the liability of indistinct transmission of syllables and words. In the Morse telegraph or any other system this contingency must be provided for, and with the telephone, as with the telegraph, mistakes are guarded against by good training and discipline, and by repeating back all communications.

Controlled Manual Block System.

Within the last four years controlled manual apparatus without track circuits has been introduced extensively on single-track lines of the Illinois Central, the Chicago, Burlington and Quincy, and the Chicago and Eastern Illinois railroads, and the electric train staff, embodying similar principles, has been put in use on 100 miles of the Southern Pacific.

As a safety device, the controlled manual system is already well understood and well developed, so that the investigation of it cannot be looked upon as calling for special attention on the part of this board; but these extensive installations on single-track lines are in some respects new departures in American railroad practice, and a study for the purpose of comparing these with each other and with other systems may be desirable at a later date.

Automatic Block Signals.

As shown by the statistics which have been published by the commission, the railroads of the country made comparatively rapid progress in automatic signaling for several years up to the end of 1907. Since then only a few important new installations have been begun; but within the past month the St. Louis and San Francisco gave an order for the equipment of 712 miles of its single-track lines, and the Southern Pacific is resuming work on some of the installations which were suspended a year ago.

The extensive installation on the New York Central and Hudson River in and near New York City of automatic block signals adapted for use in connection with railroad tracks, the rails of which are traversed by powerful electric currents used with electric propulsion of trains, constitutes one of the notable instances of progress in the signaling art.

Lack of Knowledge of the Art.

Of the hundreds of descriptions and plans of devices or systems for the promotion of safety in railroad operation examined by the board so few possess any merit that it is evident that a large proportion of the inventors or proprietors of such devices are entirely unfamiliar with the conditions to be met in railroading, the development of safety appliances, the state of the art of signaling, and often with well-known natural laws. This is manifested in three forms:

(1) In devices which, no matter how well designed or constructed, would be dangerous or of little or no value.

(2) In devices or systems which, no matter how well the details of design and construction were carried out, are fundamentally wrong in principle.

(3) In devices or systems which, while theoretically useful and workable, are designed without regard to the well-known properties of materials or a consideration of the quantitative values of the forces and velocities involved.

Dangerous devices.—As an example of the first class may be cited the highway crossing gate designed to be closed automatically by the approach of a train. It is obvious that such a device, no matter how perfect in operation, would be unsafe to use, as the gates would descend or close when the train was within a given distance of the crossing, irrespective of whether or not pedestrians or vehicles were on the crossing, thus preventing their escape from the very danger that the invention is intended to avert. Other inventions of substantially the same class are those for the automatic throwing of switches by train approach, especially those intended to restore to the main track position by the passage of the train itself a switch that has been maliciously or carelessly left set for a siding or turnout.

The board believes that switches, being movable portions of the track, are so subject to obstruction of their proper movement by foreign substances, such as stones, lumps of coal, snow, ice, bolts, nuts, and other parts dropped from cars or locomotives, that they should not be operated except by an attendant, for the reason that such attendant can detect abnormal or unsafe conditions which would prevent the proper operation of the switch. These conditions cannot be detected by automatic apparatus controlled by approaching trains except under conditions where the throwing of the switch, the locking of the switch, the releasing of the signal, the clearing of the signal, together with the necessary approach and detector locking, are all interdependent and occur in proper sequence. Even with such refinement it is considered doubtful if the reliability of operation of such devices would be sufficient to warrant their use in practice unless in special or unusual cases.

Devices wrong in principle.—The most typical devices of the second class referred to, namely, those that are wrong in principle, are signals that require the application of power to move them to the position to indicate "stop," and assume the "proceed" position by gravity or whenever the application of power to them ceases. Within this class falls also the large number of electrical appliances designed to operate on the so-called open-circuit principle. In these, the presence of electric current in the operating devices is required to give a "stop" indication or apply the brakes or accomplish the purpose for which the device is designed; whereas it is evident that all such appliances should be constructed on a principle directly opposite, namely, the closed-circuit principle, so that if the current supply should fail or a wire should break or become disconnected, or a short circuit or a cross should occur, the "stop" indication would be displayed or the brake applied, or other purpose of the design carried out. In other words, all devices or systems must be to the highest degree self-checking of their own failures, so as to render them as nearly as possible incapable of falsely indicating safety when danger exists, or if used in train control, incapable of permitting a train to proceed when it should be stopped. This principle is fundamental, and no devices or systems designed on the contrary or open-circuit principle can be approved.

Impracticable devices.—In the third class, or impracticable devices, we find many where it is intended to operate signals or mechanical trip train stops through the medium of cables or rods several thousand feet or a mile or more in length attached to treadles or other trips which are intended to be depressed or moved by engagement with some part of another moving engine or train, little idea evidently being entertained by the inventor as to the inertia of the parts, the effects of impact, the elasticity and strength of the materials employed or the conditions due to accumulation of snow, ice or sand.

Reliability.—Next to safety, reliability is the most important feature in safety appliances. By this is meant infrequency of failure of the device or system to respond to all the conditions under which it should act. For example, if a signal device indicates a clear track when the track is obstructed it is an unsafe device. If it indicates danger when there is no danger it is not reliable, and such unreliability soon becomes a source of danger, for if a signal, for example, frequently indicates "stop" when the conditions are all right for the train to proceed, its "stop" indication soon becomes discredited as a true indication of danger and may come in time to be disregarded even when correctly given, and hence lead to disaster.

Contact devices.—Many devices or systems have been examined in which contact plates or rails are included in electric circuits carrying current which either continuously or intermittently is intended to be picked up by a contact brush or shoe on the moving vehicle. While a number of such systems are designed on theoretically correct principles, the practicability of making or maintaining a reliable contact can be determined only from long-continued experiment with various forms of roadway and vehicle contacts under such conditions of speed, vibration, clearance, shock, snow and ice as exist in actual railroad working in all localities and at all times of the year. In considering any closed circuit arrangement which makes use of a continuous contact rail it must be borne in mind that a momentary loss of contact which might occur from very slight accidental circumstances might in an automatic train-stop device cause an emergency application of the brakes while running at high speed. This makes the reliability of such schemes extremely doubtful.

Equipment and structure clearances.—Inventors or designers of cab signals and automatic train stops often disregard the very definite relations that must necessarily exist between the dimensions of cars and engines and those of platforms, bridges, tunnels, road crossings and other structures along the roadway. It should be remembered, for example, that the location of end ladders on freight cars must be definite and reasonably uniform in order to make their use safe for trainmen. Yet many devices of the overhead type are presented, by the use of which freight trainmen would undoubtedly be subject to more danger than the use of the devices would prevent. The question of equipment and structure clearances should be carefully studied by all who approach this problem.

Continuous track circuit.—A number of block signal systems have been presented for the board's consideration which involve the use of much complicated apparatus and would doubtless cost as much to install and maintain as the best-known systems now in use, and yet lack the very desirable protection afforded by the use of continuous track circuits with their ability to detect broken or removed rails. This is a protective feature free to be used by any one as far as patent rights are concerned. and it is especially desirable in view of the relatively poor quality of most of the steel rails now on the market.

Work of Various Railroad Associations.

Most worthy of commendation as tending to promote the safety of railroad operation is the work that is being carried on by the various technical associations of railroad officers, notably the recent work of the Bureau of Explosives of the American Railway Association, and the efforts of that association to secure better specifications for steel rails; the joint work of the American Railway Engineering and Maintenance of Way Association and the Railway Signal Association, tending toward the adoption of a uniform system of railroad signaling, and the work of the latter association on specifications for automatic block signals and power and mechanical interlocking.

In addition to the work mentioned above, the Railway Signal Association during the last year has had the question of automatic train stops and cab signals under consideration by a committee which presented a report at the annual meeting of the association at Washington in October. This report, in addition to reviewing briefly the history of experimental installations of such devices in this country and describing various systems, submitted for adoption by the association a list of requisites of installation to which automatic stop and cab signal systems should conform to be considered safe and reliable in operation. These requisites, as amended at the annual meeting referred to and submitted to letter ballot of the Railway Signal Association, are as follows:

Railway Signal Association's proposed requests of installation for automatic stop and cab signals.—1. Apparatus and circuits so constructed that a failure of any essential part will cause the display of a stop signal indication and also the working of the automatic stopping device. The automatic stop device should be possible of arrangement so that it will not be operative or effective when the speed of the train is less than five miles per hour.

2. The train control feature must be applicable for use with the absolute or the permissive operation. With either system the release of the stopping device must be within the control of the engineman or trainman, but only after the speed of the train has been reduced to five miles per hour or less.

3. The automatic stopping device must be operative only in the direction of traffic, except in connection with signals governing reverse movements.

4. The system must be operative under all weather conditions.

5. The system where track circuits are used must be adaptable for use with a block system using track circuits.

6. The system must give protection against a broken rail, the ends of which have separated, or where a rail or section of a rail has been removed from the track.

7. The parts on the moving train must not extend beyond the maximum clearance lines, and the parts on the ground must not extend within the maximum clearance lines, except for a space of two feet above the top of the rail, within which distance the parts must clear the maximum equipment line.

8. An overlap equal to the braking distance for the maximum permissible speed must be provided for automatic stopping devices.

9. Emergency application of the brakes should be made only when a home or dwarf signal has been run by, when indicating stop. If the system is arranged to cause an application of the brakes when a train passes a distant signal that is indicating caution, the application of the brakes must not occur if the home signal is indicating proceed, or if the speed of the train is being controlled so that the train will be stopped before passing the home signal.

10. The circuits must be arranged to allow two or more engines to be used with one train, or to allow one train to push another train without having the automatic stop applied at each home signal, or to require the speed to be reduced to five miles per hour when passing a home signal that is indicating proceed.

11. The automatic stop must be adaptable for use with electric traction systems, using direct or alternating current for train operation.

12. The automatic stop and cab signal should be considered only as adjuncts to be a fixed signal system. (Note.—This is on account of the impossibility of properly checking the work of the engineman if a cab signal or automatic stop is used without a fixed signal, and also from the necessity of informing the engineman of the exact commencement of the block and the point at which the indication received in the cab shall become effective.)

At the time of compiling this report the results of the letter ballot of the signal association on these requisites have not been published. It is understood that the committee of the Railway Signal Association considers these requisites as desirable for ordinary surface railroads, and that they are not presented as suitable for urban railways, in subways or upon elevated structures.

While, as noted above, this list of requisites has not been formally adopted by the Railway Signal Association, and while the board is not prepared to discuss the proposed requirements in detail on the basis of its present knowledge, it feels that they should have the careful consideration of all who are interested in this subject.

While the action of the American Railway Association in restricting the freedom of action of the voluntary technical associations composed of officers and employes of the railroads forming this association may result in a greater harmony and economy of effort by the technical associations themselves, such restrictions will hardly tend, unless exercised with greatest care, to increase the effectiveness of the associations in the promotion of the safety of railway operation.

The board has conducted correspondence relating to 709 devices, of which number 335 are signals and train stops and 374 are other railway safety devices.

Complaints.—No small portion of the correspondence of the board has had to do with complaints and demands for an investigation of alleged suppressions of important inventions by powerful corporations and associations to the serious detriment of the public interest and great pecuniary harm to individuals. The nature of the charges made indicates a necessity for investigation to determine whether they are justified in fact, it being considered equally important from the standpoint of the public to establish definitely that such accusations are untrue as that they are true.

There appears to be a very general belief that the inventor without means or influence cannot get his inventions considered by railroad officials, and in consequence appeals by such inventors to the government for aid to secure what is believed to be his rights have been both frequent and insistent.

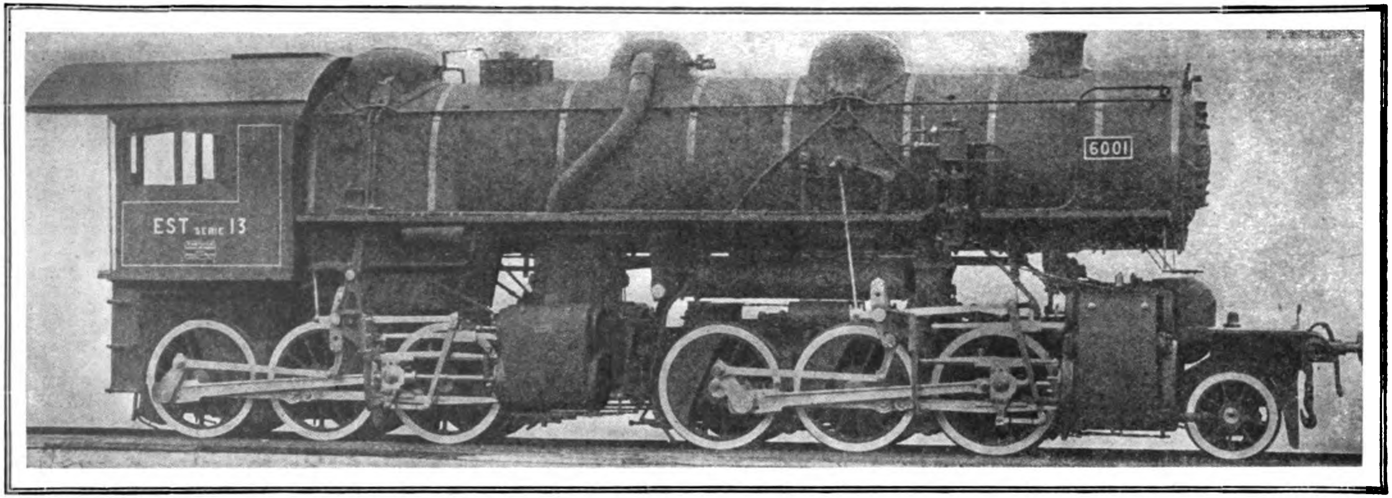
The legislation under which the board acts, while providing the machinery for investigating the use of and necessity for block signal systems and appliances for the automatic control of railroad trains and other appliances or systems designed to promote the safety of railroad operation, does not provide for the investigation of alleged suppressions of inventions, although it does indirectly aid the inventor without means or influence to get his invention considered when it has been found to possess sufficient merit to warrant a favorable report by this board.

It is believed to be in line with good public policy to provide means to satisfy the insistent demands for just treatment of the inventor, if such means do not already exist, and if they do, then to point out the way to make such means available and effective so as to satisfy the reasonable demands of the complainants.

Protests.—Another fruitful source of correspondence has been the protests of inventors on whose apparatus the board has felt obliged to report adversely, and it is interesting to note that not infrequently the most vigorous protests come from those whose devices have been found to possess a minimum of merit. This is largely due, it is believed, to a lack of knowledge of the technical requirements of modern railroad operation. In a number of instances the inventor, on having the faults of his system pointed out, has attempted to correct them and has then resubmitted his plans with corrections for further consideration. In a few instances this has led to a favorable report. It is believed that should inventors of railroad safety appliances avail themselves of the knowledge and experience of those skilled in the art, a much larger proportion of devices would be found to comply with practical railroad requirements.

In a few instances where, on account of fundamental faults in a system, the board has reported unfavorably, the inventor or proprietor has insisted on a practical test of his device notwithstanding, claiming the right to such a test under the appropriation act accompanying the joint resolution under which the board was created. The policy of the board in such cases was defined by the commission in a case referred to it for consideration at the December (1907) meeting of the board, the decision being as follows:

"If . . . . satisfied . . . . that this plan or method of train control to prevent accidents is inherently defective and could not on that account be prudent-



MALLET COMPOUND LOCOMOTIVE, EASTERN RAILWAY OF FRANCE ly adopted, we are of the opinion that you are justified in declining to expend the time and money which a test would involve. A device which in the end must be rejected as fundamentally deficient would not seem to require a test for the purpose of demonstrating its lack of practical utility."

Reports.—The board has felt it to be necessary in considering devices to be particularly careful in reporting on the same not to mislead or unduly to encourage the inventor or proprietor, who, if encouraged, might enlist capital in a venture the results of which are likely to prove fruitless. At the same time, the board has aimed to encourage the development of promising devices when it is believed that a test of the same would add materially to our present knowledge and aid in determining the availability of different features for practical use.

Among the more recent developments which are engaging the attention of those interested in the subject of railway signaling are alternating current track circuits for electric roads, working without the use of insulated joints or inductive bonds, the transmission of signal indications by Hertzian waves or other oscillatory impulses, and the production of effects upon moving vehicles as the result of conditions existing upon the track by magnetic or inductive effects without mechanical or electrical contact, involving even such principles as the non-magnetic properties of manganese steel rails.

M. E. COOLEY, Chairman,
AZEL AMES,
F. G. EWALD,
B. B. ADAMS,
Block Signal and Train Control Board.

(To be continued.)

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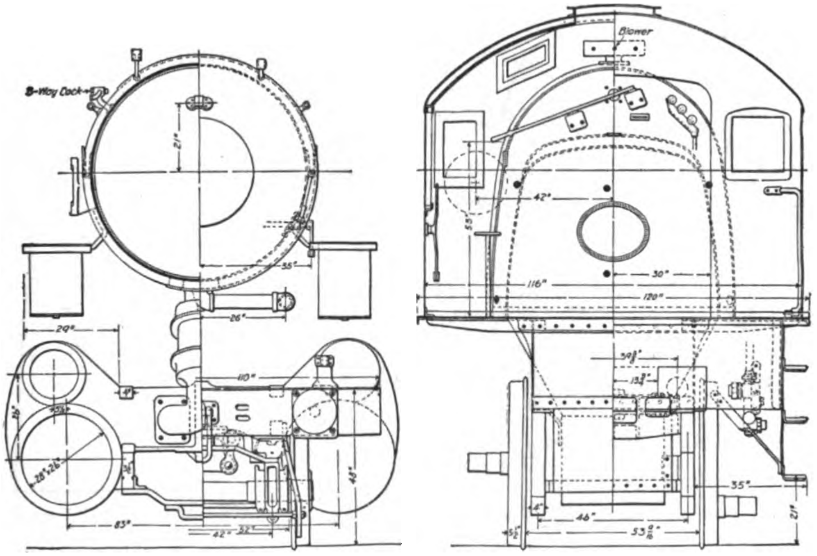
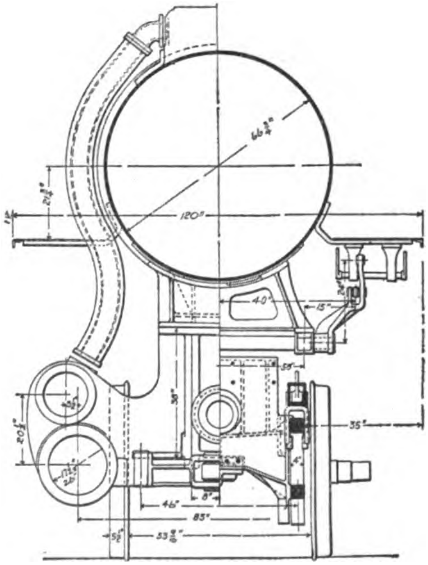
Mallet Compound Locomotive for the Eastern Railway of France.



Mallet Compound Locomotive, Eastern Railway of France—Sections

The illustrations herewith show one of two Mallet articulated compound locomotives which were recently constructed by the American Locomotive Company for the Eastern Railway of France. In general design they are decidedly American, being built to English measurements with the exception of the threads on bolts and nuts, the tires, staybolts and boiler tubes. One of the specifications of the railroad company was that these locomotives were to have front engine trucks, which compelled the introduction of features hitherto unused on this type of locomotive in this country. Otherwise these locomotives are very similar to those built by the same company for the Central Railway of Brazil. In the application of the truck it was necessary in order to obtain a satisfactory distribution of weights to locate the boiler considerably farther ahead than has been usual, which places the firebox very close behind the high-pressure cylinders. This also causes the low-pressure cylinders to be so located as to necessitate the extension of the exhaust pipe to the forward side of the casting, to permit of sufficient length to prevent cramping on curves. While the tortuous passage for the exhaust steam presented thereby is objectionable, the steam passages are liberal and the turns given as large a radius as possible, and was unavoidable in this case.

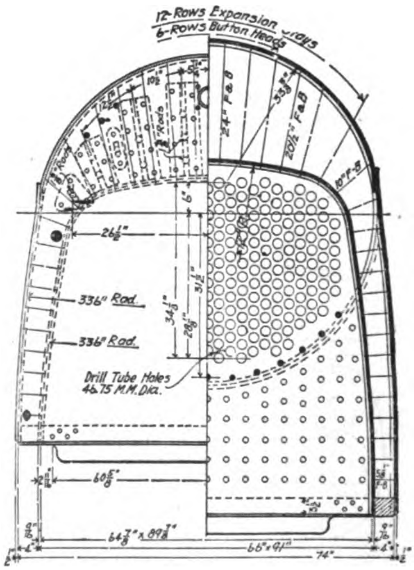


Mallet Compound Locomotive, Eastern Railway of France—Section at High-Pressure Cylinder

The results obtained from the use of ball and slip joints in the steam and exhaust pipes of previous examples of the articulated locomotive have demonstrated that they need no modification, and they have been used in the present case. Two of the views show the exhaust pipe with its joints and the variable nozzle.

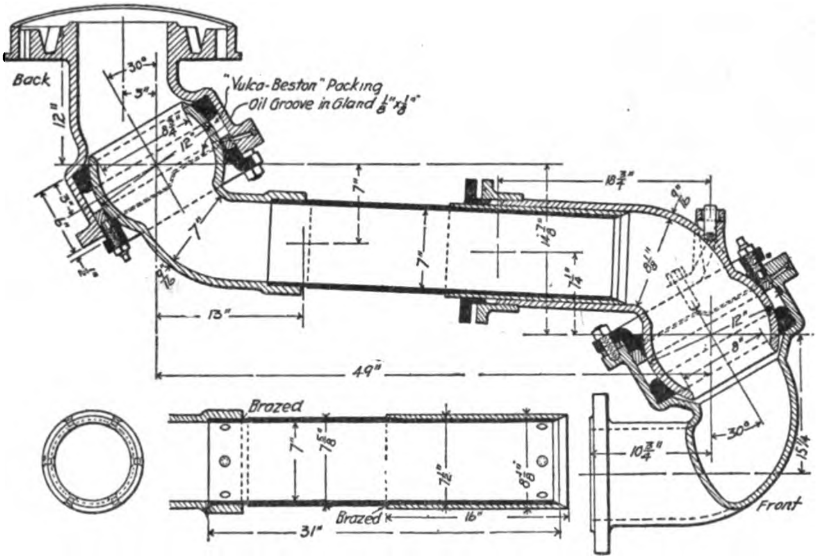
The boiler has but one support over the front set of driving wheels, instead of two or more as in previous designs, which in the present case was necessary in order that the proper distribution of weights might be obtained. However, it is supposed that but one support acts under normal conditions. With the exception of the use of a copper inside firebox and copper stays, the boiler follows closely the standard practice of America. Fig. 3 shows a sectional view of the firebox. The emergency exhaust valve, instead of being a separate mechanism on the outside of the cylinder casting, is contained in the same chamber as the intercepting valve which takes the ordinary form of the Richmond compound intercepting valve.

The Walschaert type of valve gear is employed, and is so arranged that the weights of the front and back gears counterbalance each other. The railroad company's design of screw reversing gear is employed to operate the valve gear, being very similar to that in use on other continental roads.

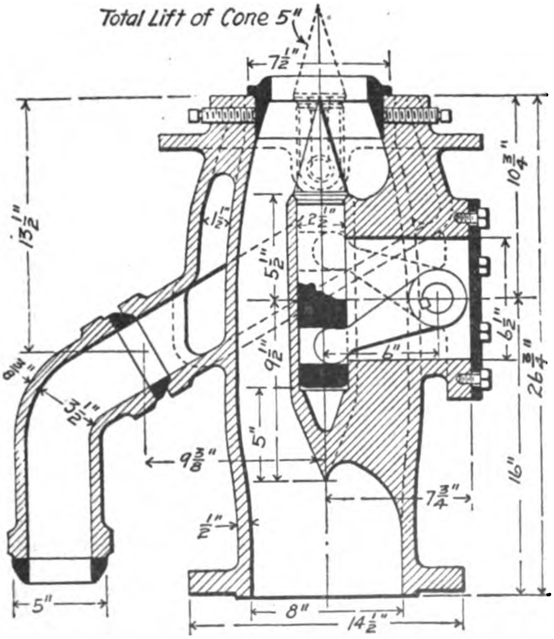


Mallet Compound Locomotive, Eastern Railway of France—Firebox

The principal dimensions of these locomotives are as follows: Cylinders, 17½ and 28 x 26 inches; diameter of driving wheels, 50 3-32 inches; diameter of engine truck wheels, 33½ inches; boiler, outside diameter of first ring, 66¾ inches; boiler, type, straight top; working pressure, 214 pounds; length of firebox, 89⅞ inches; width of firebox, 64⅞ inches; type of valves, piston; engine truck, radial swing, A. L. Co. style; grate, railway company's design; track



Mallet Compound Locomotive, Eastern Railway of France—Exhaust Pipe and Joints



**Mallet Compound Locomotive, Eastern Railway of France—
Variable Exhaust Nozzle**

gauge, 1 meter 445 millimeters (nearly 4 feet 9 inches); tractive power, 42,300 pounds; wheel base, driving, 9 feet; wheel base, rigid, 9 feet; wheel base, total, 34 feet 10 inches; wheel base, total engine and tender, 41 feet 10 inches; weight in working order, 206,000 pounds; weight on drivers, 182,000 pounds; heating surface, tubes, 2,414 square feet; heating surface, firebox, 133 square feet; heating surface, total, 2,547 square feet; grate area, 40.5 square feet; tubes, diameter inside, 44 millimeters (nearly 1¾ inches); tubes, length, 18 feet.

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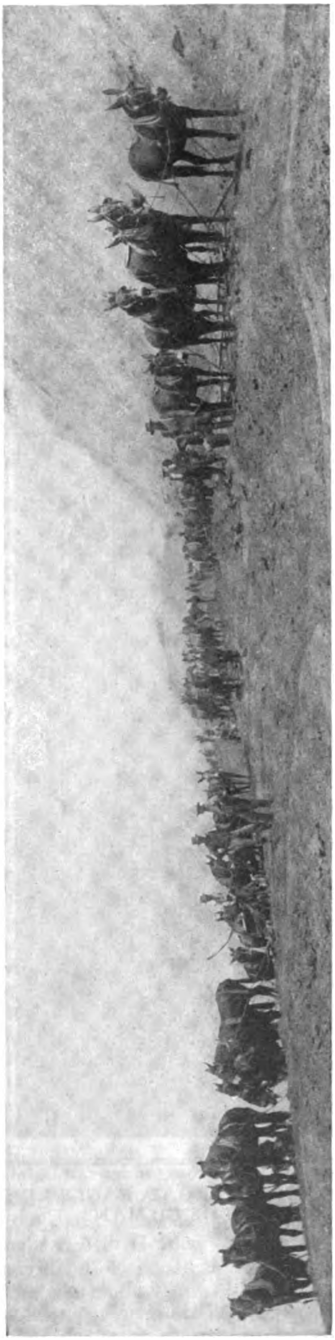
To Prevent Congestion.

To prepare for war in time of peace has been accepted as good judgment. The same idea holds good as to railroads. It is undoubtedly true that a large amount of expense was incurred by railroads during the recent period of prosperity because of inability to properly handle the business offered, thereby causing congestion and complaint. This was largely due to the inability of the railroads to foresee the extent of the flood, and, further, from inability to prepare, for same, due to lack of labor and material.

One of the prominent features of this congested period was the trouble caused by insufficient yard room and passing tracks. Because of these defects it was frequently the case that engines were held up for hours at terminals both waiting for trains and waiting to get away from trains at the completion of runs. Aside from the expense of overtime, there was the loss of the service of both crew and engine at a time when both were badly needed. Given a freight division of say 100 miles, and under normal conditions it is reasonable to expect a total elapsed time of not exceeding ten hours for a through freight crew and engine from roundhouse to roundhouse. When, because of a blockade, this time is stretched to sixteen hours or longer, there is a reduction of six-tenths in the revenue-producing power of the whole plant, and this at a time when an increase is needed. When there is added to this loss the further loss of car equipment waiting to be moved, the loss and damage arising from rough handling, the complaints of shippers, increased cost of yard service and the greater liability of wreck due to tired condition of crews, the necessity for improvement is obvious. A bridge is no stronger than its weakest member, and the revenue-producing power of a plant is limited to the output. The output of a railroad is the freight moved. To perform this service requires a roadbed, yards, depots, passing tracks, cars, engines, shops and the other necessary appurtenances. Taking as an illustration a section of 100 miles of track, it may be assumed that the cost of same, exclusive of adequate terminals, is $40,000 per mile, or $4,000,000 for the whole. Without proper yard room, the earning capacity of this plant with unlimited engines and cars is very small. With the addition of yards costing only one-tenth of this sum, the earning capacity can be increased many times. Such increase is clearly required in order to get the maximum output. The failure to provide these facilities renders a large part of the other expenditures unproductive. It is like building all of a bridge, except one member, strong enough for a 100-ton engine. Its carrying capacity is limited to the strength of the weaker part. Or illustrated in another way. Assuming a movement of twenty freight trains over a 100-mile division each way per day. If these trains could be moved promptly when made up and not delayed by lack of passing tracks en route, it should be possible to handle the movement during a rush season with twenty engines and forty crews, each engine making a round trip a day. If, because of delays, it should require an average of sixteen hours per train per trip, it would be necessary to provide at least thirty engines. At $15,000 per engine, this would require an outlay of $150,000 for additional engines alone. The increased cost of overtime, fuel and wrecks would bring this figure up considerably. Then, too, the loss in car-producing revenue should be added to the total loss. Also there was a time when competent engine and train crews were all employed and it was not possible to secure more. The only way, then, to increase the output of the plant is to reduce the time taken up in yards and on the road so as to get more trips per crew per month. The lesson is obvious. The remedy is in improved and enlarged yards and better and more passing tracks. The time to do this is during a period of comparative quiet, when the problem can be properly worked out. The recent rush should have indicated the details as to what is needed. The large expenditures for engines and cars made



GRADING BETWEEN SHAFTER AND ELKO, NEV., WESTERN PACIFIC RAILWAY

in a wild effort to move traffic will not be of much value unless the plant is so constructed as to get the proper return in the shape of frequent movement of same. This is illustrated in a striking way by the comparison of similarly situated lines in this territory. In one case a single track line properly organized as to yards and tracks moves twice as much tonnage, with less congestion, as another line similarly situated, on which these facilities were lacking. In both cases the grades and sizes of engines were similar. In other words, the output, or revenue-producing power of the first line was twice as great as the second.—The Railroad Herald.

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*Western Railroad Activities.**

Successful Giant Railroad Blast.—One of the most difficult railroad engineering feats on the line of the Ocean Shore Railway has been successfully accomplished in the way of a giant blast. Where a deep cut was being made near San Gregorio, an immense blast was made. About 18,000 pounds of powerful explosives were used in the blast, and over 70,000 cubic yards of rock were displaced. The explosion proved very successful and was accomplished without the slightest accident. A force of men were employed some time in drilling and placing the explosives. Engineers claim that this is the largest single blast ever exploded in California—in railroad work.

Teams Working On the Grade.—At present there is great activity on the Western Pacific Railroad line, especially between Shafter and Elko, Nevada. The company has rushed the work between these important points in order to close up the 100-mile gap and place the line in operation as early as possible. A great many teams have been employed on the grade, and the work has progressed rapidly.

New Station to Be Built.—All hopes of a union station in Stockton, Cal., by the Santa Fe System has been dispelled. The official announcement has been made in San Francisco that a contract has been let for the immediate erection of a new station to cost $25,000. It will occupy a site just opposite the Southern

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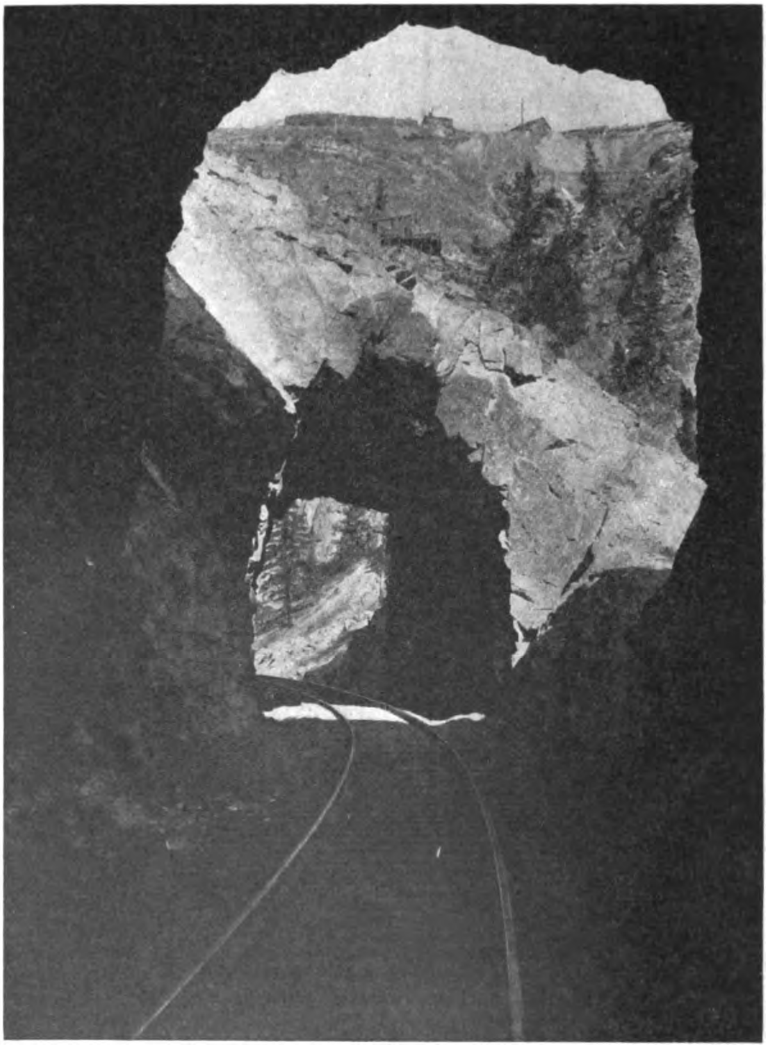
*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.



DOUBLE TUNNEL ON DENVER AND RIO GRANDE RAILROAD, EAGLE RIVER CANYON, COLO.—SHOWING MINING TOWN OF GILMAN ON THE CLIFFS IN THE DISTANCE

Pacific's station in San Francisco. The new station will be in the Mission style of architecture, and very handsome. The Santa Fe Company is also to soon construct seven new stations between Stockton and Oakdale.

Roundhouse on Sierra's Summit.—The Southern Pacific has completed plans for a large roundhouse and a 95-foot turntable, to be erected at Summit, the highest point on the line of the Central Pacific route, in Placer County. The turntable will be the largest in the west, and is made necessary by the recent order of the Southern Pacific for the construction of two giant freighters at the Baldwin Locomotive Works, that will be used on the mountain division to assist trains up the heavy grades, and to run the snow plows when required.

Oregon Short Line Surveys.—Surveys are now being made by the Oregon Short Line for a new route of 120 miles from Twin Falls, Idaho, south, to a connection with the Southern Pacific, about 20 miles east of Wells, Nevada. This proposed route will serve as a western and southern outlet for the agricultural country around Twin Falls, giving that section access to the mining camps of Nevada as well as a shorter line to the Pacific Coast.

Work Begun on the Fort Mason Tunnel.—Active operations have commenced on the Fort Mason Tunnel, San Francisco. The Southern Pacific Company, which is to construct the tunnel, has put on gangs of men at both the Van Ness avenue end and at Laguna street. The tunnel is to be 1,828 feet in length. The entrance at both places is through sandy soil, but it is expected some rock work will be encountered before the two forces meet. The new tunnel is to be 14.6 feet high to the spring of the arch, and 23 feet high altogether; it will be 17 feet wide. No limit has been placed upon the time it will take to have it completed, but Engineer Hood has received orders from the railroad company to push the work as fast as possible.

Double-Tracking.—The work of double-tracking the Eagle River cañon, on the main transcontinental line of the Denver & Rio Grande Railroad, west of Leadville, Colorado, has been completed.

The contractors, the Phillips Construction Company, and O'Gara, who commenced the work a little more than one year ago, have finished their contract, and one of the greatest engineering feats of the year has been successfully accomplished. The new second track built through the narrow Eagle River Canyon has cost the railway more than $100,000 per mile to construct, but the relief afforded by this great improvement, by which trains may be more easily operated over the steep grades on the west side of Tennessee Pass, will be worth many times the cost of construction.

In the five miles of canyon work proper there are three tunnels with a total length of 800 feet, being 100, 300, and 400 feet respectively. All of the tunnels were bored through very hard flinty quartz. There are five steel bridges, with reinforced concrete floor slab, with ballast under the track of a fine quality of crushed rock.

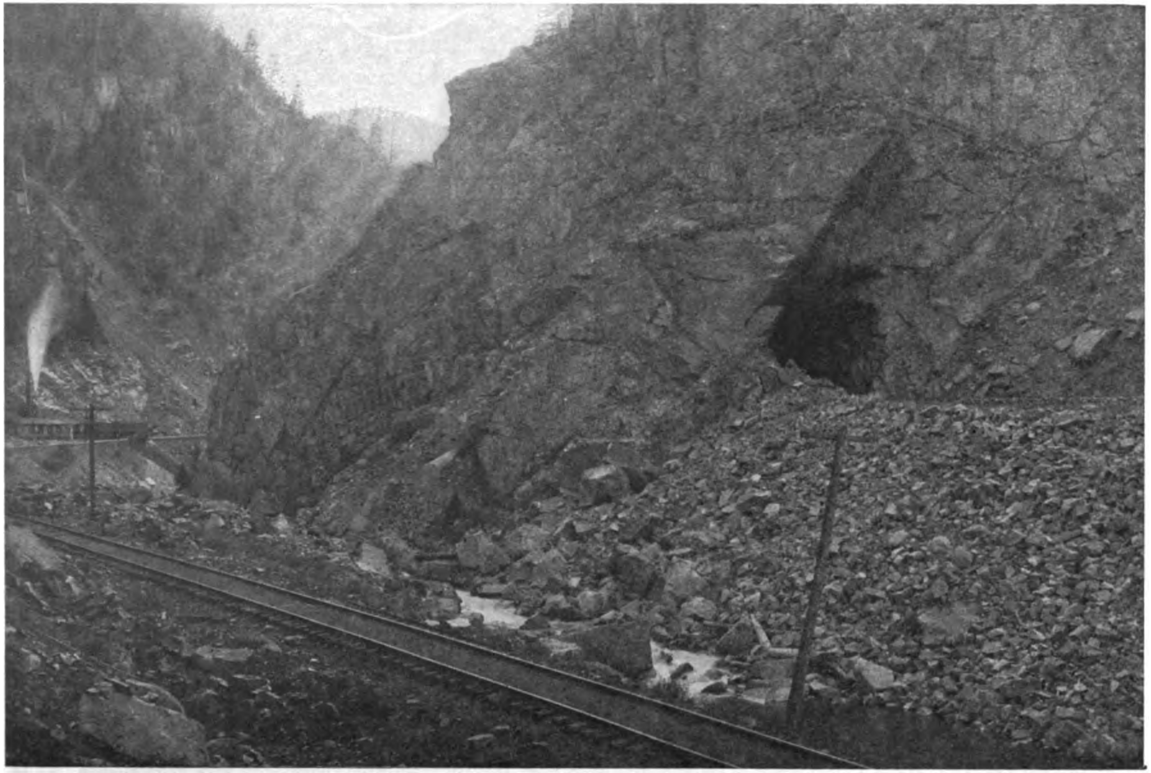
The steel girders are probably the heaviest ever used in railway construction. The track is laid with 85-pounds to-the-yard steel, rolled by the Colorado Fuel and Iron Company at their Pueblo plant, with tie plates and entirely new track material throughout. The new line, which is used for the eastbound, or up hill haul, reduces the grade from 3.3 per cent. to 2.3 per cent., and the curvature is also greatly lessened.

The enormous outlay (considering the length of the new track—in all about 8 miles), was rendered necessary by the constantly increasing business—both passenger and freight, of the Denver and Rio Grande road, and the tremendous increase in volume anticipated with the completion of the transcontinental line of the Western Pacific now building from Salt Lake to San Francisco.

A peculiarity of location, and one not met with elsewhere, is the building of the tracks on each side of the Eagle River. Between the high walls of the narrow canyon there is just room enough for the two tracks and the rushing stream.

From one end of the canyon to the other, and on both sides, mining for gold, silver, copper and lead is being carried on extensively. There is not another canyon in the Rocky Mountains traversed by a railroad where mining operations can be seen as in this, the Eagle River Canyon.

It is estimated that the total cost of this very important and difficult piece of railway engineering has been nearly $900,000, all told. The contractors crowded the heavy work forward with all possible speed from the beginning,



ONE OF THE TUNNELS ON DENVER AND RIO GRANDE RAILROAD USED IN DOUBLE-TRACKING THE EAGLE RIVER CANYON BETWEEN RED CLIFF AND MINTURN, COLO.

employing all the force which could be effectively used. The new double track is now in full operation, and the company have already begun to experience the advantages which are accruing from the outlay of money in making this improvement.

The Western Pacific is now, and will be, when its new line is completed through to San Francisco, a part of the great Gould System, as is also the Denver and Rio Grande.

The Railroad Prosperous.—The Mill Valley and Mount Tamalpais Railroad Company recently held its annual meeting. The report of the secretary, C. F. Runyon, showed that the company had enjoyed a year of prosperity and a dividend of 12 per cent. will be forthcoming. The following officers were elected: President, S. B. Cushing; vice-president, C. F. Runyon; secretary, H. W. Carother; directors, W. B. DeFremery, Daniel E. Hayes, H. F. Woods, H. B. Sperry and R. L. White.

Alaska Railroad Construction.—Not less than $12,000,000 will be expended during the current year and in 1910 in railway construction in Alaska by J. P. Morgan and the Guggenheims. This announcement has been made by M. J. Heney, the general constructor, who has recently returned from New York, where he received instructions from Morgan and Guggenheims to push to completion the Copper River and Northwestern Railroad, now being built out of Cordova. Employing 2,500 men, Heney expects to construct 50 miles more by June 1st, and have 150 miles completed to Great Bonanza Copper deposits by November 1, 1910.

Tunnel Work Nearly Completed.—The 43 tunnels on the Western Pacific's line between Salt Lake and San Francisco, aggregating in total length 45,527 feet, have been practically all bored, although the timbers have not been placed in all of them. There are at present 6,000 men now working on the whole line west of Salt Lake laying tracks at both ends. There are now regular trains running out from Salt Lake as far as Shafter, Nev., 161 miles, and in a short time will be running 100 miles further west to Elko. The entire line will probably be in operation by not later than August 1st of the present year.

Build Twenty Mail Cars.—The Southern Pacific is now building 20 mail cars which are to be entirely of steel. There is not a piece of inflammable material in the cars, for the chairs are even made of steel. These are made so that it is impossible for them to catch fire—even in a wreck—and thus the safety of the mail is assured. One of these cars is to be turned over to the railway mail service, which will use it to give a practical demonstration at the Alaska Exposition in Seattle to show how a railway mail clerk works when he is out on the road.

Harriman Plans Other Roads.—The activities of the Hill interests in the Northwest is causing Mr. Harriman to plan other roads in that territory in addition to the new line now being built from Portland to Seattle. Plans have been perfected by Mr. Harriman for the construction of between 750 and 1,000 miles of road in that territory within the next few years. These projected lines will penetrate regions now without means of transportation.

More New Stations.—The Western Pacific has completed plans for two more handsome passenger stations—one at Sacramento and one at Oakland. These two stations will be constructed almost entirely of concrete, and made fireproof. The architecture will be a blending of the old California Mission style and the classic—Greek and Roman features.

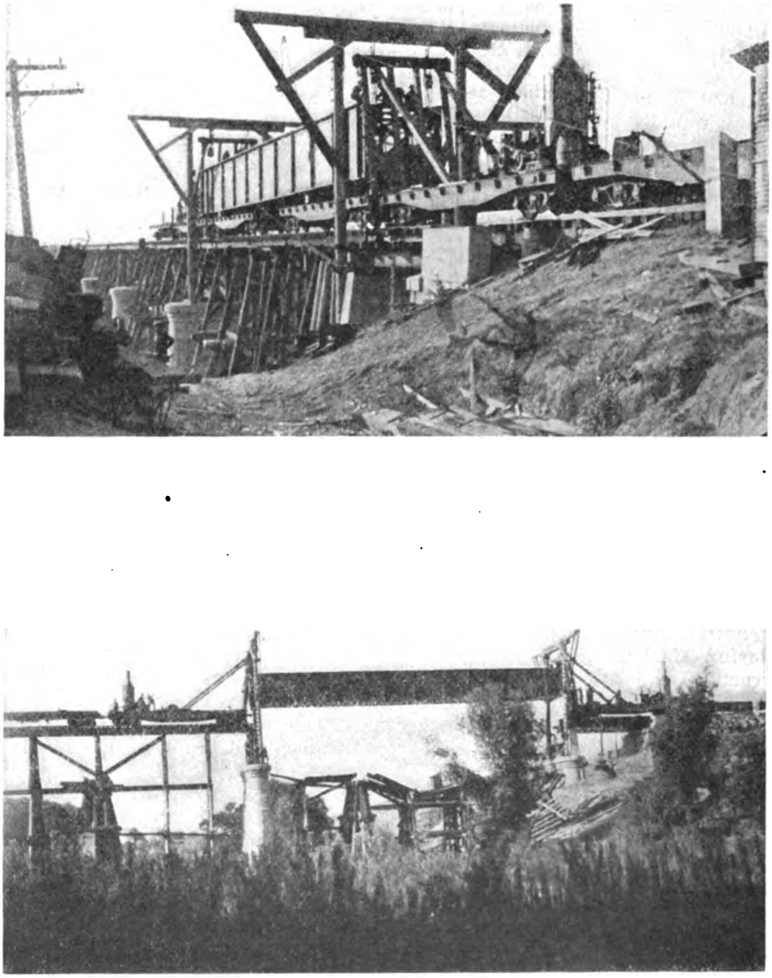
Mr. Hill's New Line.—James J. Hill's new entrance into Portland, Ore., from the east along the north bank of the Columbia River, is pronounced by expert railroad engineers to be the most expensive railroad work in the United States, having a cost of from $250,000 to $500,000 per mile.

It extends from Spokane to Portland, a distance of 423 miles. The line is now almost completed. The heaviest grade is 4-10 of 1 per cent. There are no sharp curves, the greatest being 3 per cent., and as a result one locomotive can pull from Spokane to Portland as many cars as it can start on level ground. This is expected to set new records for heavy loading.

New Bridge Across the Tuolumne River.—The very substantial concrete and structural steel railroad bridge of the Santa Fe spanning the Tuolumne River, is now rapidly approaching completion. Work on this new bridge has been in progress for more than a year. Owing to high waters and winter freshets the work has not progressed very fast, and delays have been unavoidable.

The new bridge has taken the place

of the old wooden one occupying the exact site, so the work of removing the old structure and substituting the new has gone forward very gradually, literally by piecemeal. Trains have been running regularly all of the time, so that there has been no interruption to travel and freight traffic.



NEW BRIDGE ACROSS THE TUOLUMNE RIVER.—PLACING 100-FOOT GIRDER SPANS IN POSITION

This is one of the best railway bridges constructed by the Santa Fe in California. The total cost will exceed $100,000. The contract was awarded the San Francisco Bridge Construction Company, and the entire structure has been built in the most substantial manner.

In total length the new bridge is 800 feet, there being practically no approaches from either side of the stream.

There are eight massive concrete piers and two abutments, also of powerfully reinforced concrete. The piers have their foundations from 25 to 300 feet below the bed of the stream, resting on bedrock. The floor of the bridge is about 70 feet above the surface of the stream at the average stage of water. Seven of the spans are 100 feet long each, one 70 feet, and one 28 feet. All of the superstructure is of steel, there being 1,071,850 pounds of this material used. The placing of the huge girders on the piers —100 feet long—proved a very difficult piece of engineering but was very successfully accomplished. This new bridge will soon be thrown open to traffic.

Track Laying Being Pushed.—Track laying is now in progress by the Southern Pacific from Niles to Newark. Five miles of track will be necessary to connect the two towns. When this work has been completed the Dumbarton Point cut-off will have been finished, except for the long bridge across the southern arm of San Francisco Bay. However, this bridge is rapidly approaching completion.

Change of Railroad Plans.—According to late and authentic statements the Southern Pacific officials have decided as impracticable the running of a road from San Diego to a junction with the Imperial branch of that company in Mexico. An order has been issued to survey direct through from Silsbee to Colexico, where the road will connect with the Imperial branch, while the Santa Fe branch of the San Diego and Arizona road will run from Silsbee through Imperial to Parker, giving an important cut-off to San Diego from the present route via San Bernardino.

Will Use Telephones.—The Atchison, Topeka and Santa Fe Railroad has announced that it will operate the main line from Chicago to the Pacific Coast by telephone instead of telegraph.

This substitution will be made as rapidly as possible. Contracts have been let for the installation of a telephone system between Kansas City and Emporia, Kansas. As soon as this line is completed the work will be begun between Kansas City and Chicago. The work will then commence westward toward the Pacific Coast. The cost will be about $2,000,000. The railway company believes the telephone is more accurate than the telegraph.

First W. P. Passenger Station.—The Western Pacific has let the contract for the construction of its first passenger station at Stockton, Cal. This station will cost $20,000. The contract was let to the George W. Martin & Sons Construction Company of Sacramento.

The new station is to be a long, low, rambling Mission-style structure, to be covered with white cement in rough finish, shingled in red and having a red tile ridge pole. The building will be 126 feet long and 66 feet wide from front to back, including the front arcade. Two unmatched towers will stand close together midway of the front roof, and the taller of them hold its top only twenty-eight feet above the ground level. The middle part near the towers will be two stories high, with a room or so upstairs, but the main building is one story, containing a general waiting-room, a woman's room, a men's room, the office and a baggage-room. Eleven mission arches will surround the porch-like arcades. A covered arcade will connect with a separate building 28 x 28 feet, to be used as an express building.

Will Bridge the Russian River.—The Northwestern Pacific Railroad (under the joint ownership of the S. P. and Santa Fe systems), has prepared plans for a new bridge to span the Russian river in Sonoma County. When completed this new bridge will involve a total outlay of about $100,000. Reinforced concrete will be used in building the abutments and piers, while all of the upper works will be of structural steel.

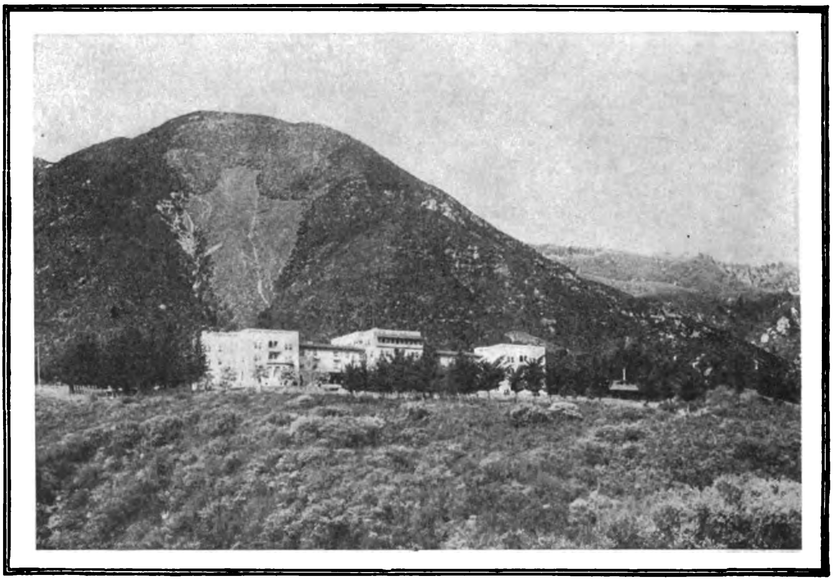
The bridge will span the stream at River Landing, about a mile above Monte Rio. It is expected to have this work completed about the middle of next summer. Work will be commenced very early in the spring, as soon as the high waters subside, and crowded forward with all practicable haste.

The Arrowhead.—The passenger department of the San Pedro, Los Angeles and Salt Lake Railroad has issued a pamphlet or booklet under the title "Legends of the Arrowhead," which is quite interesting. Upon the side of a mountain, six miles from San Bernardino, Cal., is clearly pictured the prehistoric landmark in the shape of an arrowhead which can be seen for a distance of fifteen miles from the trains of the Salt Lake Route. A good idea of this creation of nature can be formed from the illustration shown herewith.

From the booklet referred to we quote the following:

"In the belief that the general public knows scarcely anything concerning this strange formation, which the Salt Lake Route has adopted as its official trade mark, these legends are now collected for the first time, and presented in book form, in the hope that the subject matter will prove of interest to its readers.

"By actual measurement, the Arrowhead is 1,375 feet long, and 449 feet wide, comprising an area of 7½ acres, and the material of which it is composed is different in formation from adjacent parts of the mountain, consisting chiefly of disintegrated white quartz, and light gray granite, and supporting a growth of short white sage and weeds. This lighter vegetation shows in sharp contrast to the dark green growth of surrounding chaparral and grease-wood. Not a few believe that this natural mark was made by a mountain cloudburst. A great volume of water was supposed to have struck the earth at the top of the arrow, and, rushing down, formed the shank; then, obstructed by some accumulated mass of debris, it overflowed on each side and advanced with terrific force until this overflow was confined by entering the wedge-shaped configuration upon the mountain side, and the point of the arrow was shaped. The wonderfully formed symbol, so distinctive a feature of the locality, is plainly visible from all the trains of the Salt Lake Route. This fact induced the management of the road to select this unique emblem as the official sign of the system and the simple Indian arrowhead is now adopted and recognized as the identifying mark of the San Pedro, Los Angeles and Salt Lake Railroad."



ARROWHEAD MOUNTAIN

Surveys Being Made.—The Mexico and Colorado Railroad Company, supposed to be subsidiary to the El Paso Southwestern Railway Company, has commenced surveying a line from Douglas, Arizona, to Courtland, a new copper mining camp 35 miles north of Douglas. The purpose of this new road is to bring the Courtland ores to the smelter at Douglas for reduction. The line is to be completed within six months. Walter Douglas of Bisbee, Ariz., is president of the M. & C. R. R.

Two Largest Engines in the World.—The Southern Pacific Company has ordered the Baldwin Locomotive Works in the east to build for it the two largest and heaviest locomotives in the world.

These engines will each cost between $30,000 and $35,000, and with the tenders, will weigh 530,000 pounds each. The locomotives proper will form a weight of 430,000, and the tenders 150,000 pounds. The weight on the driving wheels will be 490,000 pounds. In design these monster engines are of the Mallet articulated compound type, with improvements over the Frenchman's original plans. They will have 16 driving wheels, or two sets of eight wheels each. There are also two sets of cylinders, one set being between the two sets of drivers. The tender has a capacity of 9,000 gallons of water and 3,000 gallons of oil. It is the purpose of the railway company to use these two monster locomotives in hauling freight from Sacramento over the Sierra Nevada Mountains to Truckee. The officials say that these two engines are expected to perform the same work of four of their present largest and most powerful locomotives—and even a little more.

At present four engines can haul 45 loaded freight cars over the heavy mountain grades. The new ones are expected to haul 50 loaded cars daily between Sacramento and Truckee.

Contract to Bore a Big Tunnel.—J. D. Farrell, general manager for the Oregon and Washington Railroad, a Harriman corporation, and known as the Union Pacific line from Portland to the Puget Sound, has awarded the contract to bore a big tunnel under part of the city of Tacoma. This heavy contract was awarded Arivid Rydstrom and H. S. Hudson, of Tacoma. The contract calls for the construction of a tunnel under the business section of Tacoma 8,647 feet long, and the amount of the contract is approximately $1,000,000. Work for this great bore will be commenced at once.

A New Line in Nevada.—A decision has been reached to begin at once the construction of a railroad across the Nevada desert from Ely to Goldfield. The new line will be called the "Ely and Goldfield Railroad." Its total length will be 207 miles, connecting at Ely with the Nevada and Northern Railway, and at Goldfield with the Tonapah and Tidewater. The decision to construct this new line is the outcome of a meeting recently held by a number of New York capitalists who are very largely interested in mining and railway projects in Nevada.

*Recent Types of Express Locomotives.**

The four-coupled locomotive is still deemed suitable for express service on many railroad systems, either because the conditions of traffic allow the weight of the train to be kept under a certain average, or because the stops are far apart and the grades light. Nevertheless, it seems that its hours are numbered, not only in countries where the load per axle is limited to 15 or 16 tons, but even on lines where an adhesive weight as high as 40 tons on two axles is permitted.

The four-coupled locomotive in its most recent form, the Atlantic type, is perfectly adapted for the fastest train services, and when fitted with a wide firebox its grate area per unit of adhesive weight may attain a very high proportion, which is, as is well known, a characteristic of engines suited for fast trains.

The Atlantic type is compact, can be very well proportioned, is adapted for the use of a wide firebox, and constitutes probably the last word in four-coupled engine design. Its only disadvantage is the limitation of the adhesive weight to some 30 to 40 tons, according to the limits laid down by the permanent way staff, save in America, where a weight of as much as 50 tons is permissible. It is a recognized fact that the locomotives do not use all or even the greater part of their adhesive weight, except on starting, on severe gradients, or in passing through tunnels, so that where the stops are fairly far apart and the road easy four-coupled engines may be sufficient with trains which at first sight would appear to be beyond their power. But this type is confined to a well-defined kind of service, and hence might be considered on certain systems as too highly specialized. The Atlantic engine, having a large proportion of its weight concentrated on the center—where are the coupled axles—has some tendency, when running at high speeds, to a pitching motion; much more so, indeed, than engines having a coupled or heavily loaded trailing axle.

Six-coupled engines mounted on large driving wheels behave as well at the high speeds actually attained as four-coupled engines, while they are able to start heavier trains and to accelerate them more quickly. They have, in fact, a reserve of tractive power which proves very valuable upon occasion. At the same time, being less specialized, they are available for a greater variety of service, and may be employed for heavy slow trains with frequent stops, or even, in case of necessity, for goods trains.

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*From a paper by Maurice Demoulin, in The Engineer, London.

Adhesion is only one factor in the power of locomotives, and is, indeed, as we have said, only fully utilized for a comparatively short time. But while it determines the maximum tractive effort actually obtainable, the grate area is the principal factor in deciding the tractive effort which any given engine can exert at the highest speed it may be called upon to attain, or, inversely, the maximum realizable speed for a given tractive effort. To put it in another way, the maximum *static* effort is settled by the adhesion, while the work which any locomotive can develop is decided by the area of the grate. Thus the latter may be, in some sort and within certain limits, independent of the weight available for adhesion; the work, proportional to the product of the two factors, speed and tractive effort, can be constant for important relative variations of each of these two factors.

Take the case of two engines having the same boilers and the same grate area, one of the Atlantic and the other of the 4-6-0 type. They will both be able to maintain the same tractive effort at the same speed—say, 50 miles per hour—but the second will possess as its sole advantage the power of making a quicker start or of developing its maximum power with a heavier train at lower speeds. If, on the other hand, the increase of adhesion ought to correspond with the traction, at the same given maximum speed, of heavier trains, it ought of necessity to be accompanied by a proportional increase of the grate area. But the provision of a large and deep firebox is much more difficult on an engine with six-coupled wheels of large diameter than on a four-coupled Atlantic engine.

As a matter of fact, if the narrow firebox is retained in the latter type, as the trailing wheels are of a comparatively small diameter, it is possible to give the firebox a sufficient depth without raising the boiler too much, or giving the grate an excessive inclination. Typical examples of this arrangement may be seen in the Atlantic engines of the P. O., Nord, and P. L. M. in France, and the Northeastern, Great Central and Lancashire and Yorkshire in England.

If, on the other hand, the wide firebox is adopted, it is not necessary to give to the boiler the excessive length which it attains in the Pacific type, and it is possible to obtain the same grate area with much less total weight, but the adhesive weight is, of course, smaller too. Most of the great American railroads, the Great Northern and Brighton in England, and the Prussian State Railways have Atlantic engines with wide fireboxes in service, but though such engines are compact and powerful, their adhesive weight, on account of the continual increase in the weight of trains, is growing more and more insufficient on some systems, or at least on difficult and hilly sections of such systems. The type appears to be principally suitable for lines on which axle weights of 20 tons and over are allowed. In the United States some Atlantic engines take 50 tons on the four-coupled wheels, while in Germany and Italy such a weight cannot be carried on less than three axles; but as the weight of trains in America is greater than in Europe, the situation is about the same, and the Atlantic type is there also becoming insufficient.

The combination of the wide firebox and six-coupled wheels of more than, say, 5 feet 6 inches diameter, has led to the introduction of the Prairie and Pacific types. The obvious difference between the two designs, namely, the use of a leading pony-truck in the former and of a leading bogie in the latter, appears at first sight to be of small importance, but it carries with it a factor of more account, for while the cylinders of the Prairie type are placed between the leading and the coupled wheels, in the Pacific type they are brought more to the front between the wheels of the bogie. The result is a notable lengthening in the Pacific engine, not only of the frame, but of the boiler. As far, however, as the latter is concerned, the whole length available for the tubes is not used, either to avoid a surplus of weight or to obviate the troubles that might result from the use of very long tubes. In fact, the Prairie type is really a mogul engine, but it has a wide firebox over a fifth axle, trailing and noncoupled. The Pacific, on the other hand, results from a similar transformation of the 4-6-0 engine, or better still, of the Atlantic type, with a wide firebox, lengthened in the center by the amount necessary to permit the introduction of a third pair of coupled wheels between the cylinders and the firebox. These two types can thus be considered as resulting from the adaptation of the wide firebox to engines having six-coupled wheels of more than five feet diameter. The development of the Pacific and Prairie types, which are necessarily long engines, is made easier by the fact that the driving wheels of express engines are now made of a rather smaller diameter than of old. There is, indeed, a general tendency to think that wheels of 6 feet 3 inches to 6 feet 7 inches are quite sufficient for the highest speeds, and hence these engines have boilers appreciably shorter than if it were deemed necessary to provide them with seven-foot wheels.

The Prairie type offers similar advantages to those of the Pacific, namely, the combination of the wide firebox having a large grate area with six-coupled wheels of large diameter, but it does not permit of such a great increase of power. It has one axle less, and its weight is kept proportionately smaller. For equal adhesive weight the Prairie type carries of necessity a less heavy and less powerful boiler. Furthermore, some engineers consider it less steady, the leading pony, or Bissel truck, lacking from this point of view some of the advantages of a bogie.

Putting aside the question of steadiness—to which we shall return later—the choice between the two types of engines is decided by the relation which it is desired to establish between the adhesive weight P and the grate area S, while bearing in mind the preceding considerations. The ratio $\frac{S}{P}$ is, of course, for any given type of engine greater, as it should normally be able to draw, at a higher speed, a load proportional to its adhesion; therefore the Pacific type can be more specially adapted for high speeds than the Prairie engine as long as the load is a maximum. The latter (2-6-2) will give to some extent the advantages of the former, while it keeps within the limits of weight and complication of the Atlantic type, but the former (4-6-2), having a larger boiler, will be more powerful. It is thus, indeed, that the problem has been generally understood. The Pacific type has been recently introduced on several European lines where the speed and weight of trains are considerable and the stops far apart—Great Western and Paris-Orleans, for instance—while the Prairie type has been usually adopted on lines with a lighter permanent way and a less heavy traffic. The Prairie engine, for example, designed by the State Railways of Italy for express service, is certainly remarkable, and particularly well suited to the traffic it has to deal with. This engine—Fig. 1—has a grate area of 37 square feet, its wheel base is less than 28 feet, and its total weight in running order only 70.7 tons. The steadiness of this engine compares very favorably with that of any 4-4-2 locomotive—a type to which, indeed, it is closely related, being in reality an Atlantic locomotive in which the second axle of the bogie is coupled; it is fitted with the Zara-Bissel bogie, and the truck axle, in conjunction with the first coupled axle, forms a bogie with lateral play so controlled and arranged that while the front axle moves radially the second axle moves parallel to itself by an amount compatible with the coupling. In a word, these engines have a leading bogie with a long wheel base, but of which one of the pairs of wheels is coupled. The flexibility and steadiness are very satisfactory, and the wear of the crank pins of the front coupled wheels is in practice very small. This interesting arrangement is a real improvement of the Prairie type, particularly for difficult lines where the curves are sharp and frequent.

The 2-6-2 and 4-6-0 types have the same number of axles and the same adhesive weight for a given load per axle, but in all other respects they are radically different. In the 4-6-0 engine mounted upon large wheels the firebox has obviously to be of the narrow type, and the grate area is limited to some 34 square feet. If the fuel used is of sufficiently good quality—as, for example, on lines burning the best Welsh coal—to make useful an adhesive weight of 50 to 55 tons, with a grate not exceeding the dimensions given, this type, of which there exist in England some notable recent examples, appears to be preferable to the ordinary Prairie type for express trains, more especially because it has a leading bogie. On the other hand, for suburban service, the Prairie type possesses numerous advantages in its general arrangements, and is better adapted to receive coal bunkers and water tanks.

If, on the contrary, the inferior grade of the coal or any other reason renders necessary a grate area exceeding 34 to 35 square feet, the wheels being of large diameter, the Prairie type has to be adopted, unless, of course, the number of wheels can be increased, and then we have the Pacific type.

It is well known that the steam production of a boiler and the power of a locomotive do not increase proportionally with the increase of grate area. The typical high combustion apparatus is the old deep firebox, for many years common, in England particularly, fitted with a brick arch deflecting plate, etc., in which frequently as much as 130 pounds and even 140 pounds of coal per square foot of grate per hour was burned. Under the same conditions a wide firebox having 47 square feet of grate area would burn 6,000 pounds of coal per hour, which is much more than one stoker can possibly handle, particularly on a long journey.

We must, then, consider the wide firebox from two points of view: First, when the coal is of a good standard quality, thus allowing the consumption per square foot to be reduced, and facilitating stoking, while at the same time ensuring an increase of power; and, secondly, when the fuel is of a kind unsuitable for the high rates of combustion.

Independently of the difficulty of supplying fuel for a very high rate of combustion to a furnace of 40 to 50 square feet, other considerations limit this combustion. The wide firebox, being designed to extend over a pair of wheels, cannot be very deep, while the depth of the firebox appears to be one of the most necessary factors for complete intense combustion. It is difficult, while running, to regulate the thickness of the fire and its combustion over the whole area of a very large grate. The position of the ashpan is not always such as to permit an easy and regular flow of air to all parts of the grate. The front corners of the furnace on each side of the tube plate are apt to become dead areas, the draught being less efficient there than in the center. Large grate areas are also uneconomical where long stops have to be made, as in goods engines, because of the high consumption of fuel during such stops, which, obviously proportional to the area of the grate, it is impossible to reduce below a certain minimum. Under these conditions it is not surprising that many engineers are reluctant to pass from the 34 square feet grate—the approximate limit of the narrow box—to the 45 or 50 square feet of the wide firebox, particularly when they have at their disposition a good class fuel.

If, on the other hand, one looks at the question from the standpoint of evaporation, the advantage seems all in favor of the wide firebox, both on account of the increase of direct heating surface and of tube surface, the latter being due to the great length of the tubes in engines of the Pacific and Prairie type. It seems also probable that the use of the wide firebox will lead to a reduction in the cost of maintenance and repairs. The reduced length of the box for a given grate area, the better form and disposition of the lateral water spaces, the possibility of widening them, with the consequent lengthening of the stays, and the better circulation of the water, are all elements likely to reduce the chances of leakage and the wear of the different parts of the firebox. It is, however, possible that a longer experience will prove that the wide firebox has its own particular weaknesses.

The author has no partiality in favor of big engines in themselves. On the contrary, he believes that the most advantageous policy is probably to make the best of moderate size engines, using good coal, and to push them, as long as the efficiency of the boiler is not reduced below a good average and the wear and tear is not abnormal. He is well aware of what some English companies can do with locomotives having not more than 28 square foot grates, and believes that the use of very good fuel and an intense draught is one of the best ways of increasing the power of locomotives. But the system has its limits, and first grade coal is not available at a reasonable price in most countries.

The increase of grate area, so general in locomotives of all countries, constitutes a real and undeniable advance, on the understanding that it should not exceed the conditions, nor be accompanied by a large and intentional reduction of the combustion per unit of surface, a reduction contrary to the principle according to which the efficiency of the locomotive falls as the weight per unit of power increases.

Under these conditions and with these reservations, the Prairie and Pacific types are very probably the engines of the future in Europe, the first more particularly reserved for lines with a moderately heavy traffic—unless heavier axle loads are permitted, as in the United States; the second on the great lines where the speed and loads are considerable. They both represent a rational type combining large grate areas, with the use of six-coupled wheels of large diameter; they are well balanced and very steady. Their development in Europe is probably only a matter of time, but is closely connected with the improvement and strengthening of the permanent way in some countries.

As far as the number and position of the cylinders is concerned, it is difficult to say with any certainty what arrangement will prevail, and it is possible that no single type will become general. The Americans build more powerful locomotives than any made in Europe, and adhere to the use of two cylinders as large as 22 inches by 28 inches; they do not seem to fear the effect of such enormous stresses on two crank pins only. Many European engineers, on the contrary, prefer dividing the load on four cranks at 180 degrees to each other, which besides permits of balancing the reciprocating weights. This appears to be a rational arrangement for powerful engines, and there are good reasons for believing that it has come to stay, at least in well-defined cases.

In the case of four-cylinder engines, either simple or compound, I am inclined to prefer having the four cranks mounted on the same driving axle, at 180 degrees, of course. The wear of the driving axle-boxes with powerful engines is a constant source of trouble, and it seems rational to reduce the fore and aft pressure on box brasses by balancing the stresses.

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*Superheated Steam and the Best Method of Getting Good Results When Engines are in Service on Trains.**

In last year's report the Schmidt, Cole and Vaughan Horsey Smoke Flue and also the Baldwin Smoke Box Superheaters were fully described and illustrated.

In the Schmidt design the superheater elements were shown to be two U-shaped tubes in one smoke flue as applied to Canadian Pacific locomotives, while the elements of the same type of superheater as applied to locomotives of the Great Northern, Northern Pacific and Burlington roads consist of a double loop, thereby reducing the connections with the steam heaters to one half. It will not be necessary to give a drawing of this particular double looped element, because it will be dealt with in the Toltz Superheater used on the Great Northern, a description and plans of which are herewith submitted.

The smoke flues, which have an outside diameter of five inches and the ends of which in the fire-box sheet are reduced to 4¾-inch outside diameter, are arranged in four horizontal rows, six in each row. Both ends of the smoke flues are rolled and expanded into the flue sheets.

The superheater elements consist of seamless cold drawn steel tubing 1⅜-inch outside diameter, No. 9 gauge, which makes the inside diameter just exactly one inch. One end of this element is connected to a clip or flange, runs back into the smoke flue toward the fire-box sheet within 24 inches, returns toward the front end, from where it runs back again toward the fire-box flue sheet within a distance of two feet and six inches thereof, and then returns toward the front where the other end is also connected with the aforementioned clip. The return bends are made of cast steel, into which the tubing is screwed, the threads of the tubing being cut on a slight bevel.

The clip or flange (see drawing) is also made of cast steel and has two separate passages, which are so arranged that the ends of the superheater elements can be rolled and expanded into them, after which the openings toward the front are closed with screw plugs. These clips are then connected with the respective steam chambers of the steam header, one of the openings leading into the saturated steam chamber and the other into the superheated steam chamber. The clips are fastened to the header in pairs (one on each flat side of the steam header) by one bolt, which can easily be removed.

There are three steam headers running in vertical direction, each one having a saturated steam chamber nearest to the smoke box flue sheet, and a superheated steam chamber in front of the former, all in one casting. These headers are made very flat, so that each superheater element connected therewith can be drawn out of the smoke flues singly and without difficulty. The saturated steam chambers are connected with the dry pipe by a casting on top, while the superheated steam chambers are connected with the steam chests on the bottom as shown on the plan. The headers are hung to the smoke box shell by two bolts or hangers. The cast iron pipe between the superheated steam chambers and the steam chests has ball joint connections.

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*Committee Report, Sixteenth Annual Convention, The Traveling Engineers' Association, Detroit, Mich., August 25, 1908.

The dampers which are used in all other smoke flue superheaters have been done away with and a common standard front end with netting has been applied.

The steam connections between the superheater elements and the headers, also between the dry pipe and the headers and between the superheated steam chamber and the steam chest, where there are no ball joints, have copper gaskets inserted.

The headers are made of cast iron.

The throttle valve is on top of the dry pipe in the dome. The steam enters through the dry pipe into the saturated steam chamber, from there through the superheater elements into the superheated steam chamber and from there into the steam chests. In using the double looped element a higher degree of superheat is obtained, and, as mentioned before, the steam connections between these elements and the headers are only one-half in number compared with the design of superheaters in which two U-shaped superheater elements are used in one smoke flue.

The steam pressure with which this engine is worked is only 135 pounds, and accordingly the cylinders have been enlarged from 19 to 25¼ inches.

The Great Northern is experimenting with this engine for the purpose of finding the most economical steam pressure which can be adopted in connection with a certain degree of superheat when such engine is running in a bad water district. It is hoped that the boiler repairs will be decreased to a minimum with low steam pressure, and at the same time no water will be drawn into the cylinders, because the superheater will evaporate the same before it reaches the valves. No definite results regarding the best boiler pressure and the most economical degree of superheat have been established as yet.

In the following statement the superheaters will be named thus:

Schmidt	German
Cole	Schenectady
Vaughan-Horsey	Canadian Pacific
Toltz	Great Northern
Vauclain	Baldwin

There are at present the following superheated locomotives in operation:

Road.	*Type Superheater.*	*Number.*
Canadian Pacific R. R.	C. P R.	485
Canadian Pacific R. R.	German	21
Chicago, Rock Island & Pac. R. R.	Schenectady	6
Chicago, Rock Island & Pac. R. R.	Baldwin	1
Pitts., Shawmut & Nor. R. R.	Baldwin	1
Central Railway of Brasil	Baldwin	2
Chicago & Alton R. R.	Baldwin	1
Atchison, Topeka & Santa Fe R. R.	Baldwin	59
Central Railroad of Georgia	Baldwin	1
Union Pacific R. R.	C. P. R.	1
Union Pacific R. R.	U. P.	1
Minn., St. P. & Ste. Marie	Schenectady	1
Chicago, Burlington & Quincy	German	2
Chicago, Burlington & Quincy	C. P. R.	1
Northern Pacific R. R.	German	1
Northern Pacific R. R.	Schenectady	1
Northern Pacific R. R.	C. P. R.	1
Great Northern R. R.	German	2
Great Northern R. R.	G. N.	1
Boston & Maine R. R.	Schenectady	1
New York Central	Schenectady	1
Lake Shore & Michigan Southern	Schenectady	1
Lake Shore & Michigan Southern	C. P. R.	1
Chicago & Northwestern R. R.	Schenectady	1

This makes the number of engines equipped with superheaters 594, of which 241 were applied during the year 1907-1908.

The Union Pacific superheater mentioned above is of the smoke box type, but the committee has not been able to obtain any details of it, otherwise a description would have been embodied in this report.

A list of twenty-one leading questions relating partly to economy and construction, but mainly to the operation and maintenance of superheaters, was sent to all roads operating superheated locomotives, and it is gratifying to mention that with only a few exceptions full and explicit answers have been received by the committee. Accordingly it can be reported that the economy in coal consumption runs from 10 to 20 per cent., the highest being attained on Great Northern freight engines which show 20 per cent. saving in coal. These figures were taken from the monthly performance sheets. The saving of water averages between 12 and 25 per cent.

The superheat obtained in the smoke flue superheater ranges from 100 to 150 degrees Fahrenheit, which gives a maximum steam temperature of 500 degrees Fahrenheit in the valve chest, while in the Baldwin only from 30 to 50 degrees Fahrenheit are maintained with a correspondingly lower temperature of the steam in the valve chests.

The steam pressure on all superheated engines has been reduced from 20 to 45 pounds below that of the pressure of the sister engine worked with saturated steam. In consequence the cylinders have been enlarged proportionately.

It is admitted by every one that the superheated steam engines not alone handle trains better and in passenger service especially pick up the train quicker, but they can haul a better tonnage than the saturated steam engines of same size and type. The average of this increase in haulage is 10 per cent., while the maximum has been recorded to be 17 per cent.

There has been no trouble in regard to lubrication. On all superheated engines, except one, hydrostatic lubricators are used successfully, by which the oil is fed directly to the valves and to the cylinders. One engine on the New York Central is equipped with an oil pump, which is connected to and actuated by the cross-head and is reported to work satisfactorily.

The amount of valve and cylinder oil used for superheated engines is slightly more than for saturated steam engines, the average being 5 per cent., yet some of the roads claim as high as 20 per cent., but every report states that no exact figures in this respect have been recorded. Only the Santa Fe reports that the superheated locomotives show a saving over corresponding saturated steam engines in the use of valve and cylinder oil, due to reduction in amount of water of condensation in the cylinders.

On the Canadian Pacific more or less trouble has been encountered with the piston rings as well as with the valve rings, which have to be renewed almost every two months. When the piston rings were removed they were worn down almost to three-eighths of an inch, but the cause of this trouble can be laid to the fact that the piston is only supported by the cross-head. On the engines of the Great Northern, Northern Pacific and Burlington Roads, equipped with the German superheater, the piston is supported at both ends and the piston rings have not been changed for fourteen months. On the latter engines the rings for the piston valve have not shown any wear. At each end of the valve only one wide ring is used which has several circular grooves with numerous small holes for the purpose of leading any steam that may leak through from the admission side to the back of the ring so that it can act as a spring to give the ring a closer contact.

The large smoke flues fill up with cinders, ashes, etc., and are blown out every second or third round trip, but in some instances where very soft coal is used it was necessary to do this every round trip. The blowing out is done with air from the fire-box end. On one road, due to a certain grade of coal, clinkers were formed on the ends of the superheater elements nearest to the fire-box flue sheet. These clinkers are removed with a special tool or hook from the fire-box end. At any rate it is very important that these large smoke flues and the superheater tubes should be kept clean, so that the degree of superheat will not be decreased. On the Boston & Maine a flue blower is installed in the smoke box in connection with a Schenectady superheater, but the committee has not as yet been able to obtain the details of same.

On some engines the large smoke flues are screwed in the fire-box sheet and could not be kept tight except by rolling and expanding. In all engines equipped during the last year with smoke flue superheaters, both ends of these flues were rolled and expanded into the flue sheets and have given less trouble due to leakage than the ordinary boiler flues. The Great Northern state that the large flues act at the same time as stays and assist in preventing especially the fire-box flue sheet from bulging out.

In a few cases some of the tubes of the superheater elements have burst or split where they are connected to the U-bent castings near the fire-box. This was partly due to insufficient care having been taken in making the pipes to correct length, and partly it has been traced to using lap or butt welded tubing instead of cold drawn seamless steel tubing.

Particular attention must be paid to the connections of the superheater elements to the steam headers so as to insure perfectly tight joints, because in case of leakage not alone high costly steam is wasted, but such steam cuts grooves into the castings and makes it therefore difficult to tighten the joints, which only can be done by plugging the grooves.

Next—attention must be given to the dampers which are used in connection with the German, Schenectady and C. P. R. smoke flue superheaters. They should be inspected at least once a week to see that the hinges and also the levers connected therewith have free movement. Particular care should be paid to the packing of the small steam cylinder which is located on the outside of the boiler shell and which actuates the levers and the dampers. Some of the roads have had no difficulty whatever with the dámpers by using ordinary roundhouse methods.

In some instances superheater headers were broken, but it was found that it was either due to defective material or defective design.

In the Baldwin smoke box superheater the failure occurs in some of the outside superheater tubes being worn through by the cutting action of the cinders in the front end.

So far the addition of a superheater has not increased the cost of engine repairs per mile. The few mechanical defects which have been found have been remedied and it is expected that in a short time the defects in the existing types of superheaters will be practically eliminated so that the engine can go from one shopping to another without any special repairs being made to the superheater proper.

Your committee's recommendations can be summed up in the following:

1. Every traveling engineer should make himself familiar with the design and construction of the superheaters now in use on locomotives.

2. In the operation of the superheaters the following suggestions should be carried out:

(a) When working steam, open throttle valve fully and regulate with cut-off.

(b) Keep water level in boiler as low as in saturated steam engines.

(c) Ascertain that dampers (where equipped) in smoke box are working properly, also that the small steam cylinder actuating these dampers is not leaking through stuffing box.

(d) Be sure that oil is carried from lubricator to each end of valve and also to cylinder.

(e) Any leaky steam joints at cylindder or valves should be tightened, and if connections or joints of superheater proper should be found leaking, report at once at end of run.

3. The work of maintaining and taking care of the superheater in the roundhouse is enumerated in the following:

(a) Keep all steam joints and connections of superheater, as well as cylinders and valves, tight.

(b) Piston and valve rings should have a close fit to cylinder walls and valve bushings respectively.

(c) Clean or blow out large smoke flues whenever necessary. The more attention paid to this work the more economy will be attained with the engine.

(d) The ends of the large smoke flues which originally were screwed in the firebox flue sheet and have given trouble by leaking, should be rolled and expanded.

(e) In renewing tubes of superheater elements, use only seamless cold drawn steel tubing. See that they are put in correct length, otherwise, due to contraction and expansion, the connections in the U-bent castings will work loose and leak or tubes will split.

(f) The ends of the superheater elements nearest to the fire-box are supported by lugs or legs of the U-bent castings. Due to the expansion and contraction of the elements, these lugs ride or chafe the bottom of the large smoke flues. Ascertain if this riding or chafing has weakened the large tube. If so, renew the tube.

(g) Pay attention to the dampers, their lever connections and the small steam cylinder. Pack the latter one whenever necessary, as any leakage will be detrimental to operating the dampers. See that all hinges of dampers, also the lever connections, are in good working order.

(h) The lubricator should be tested whenever necessary.

(i) The injectors must be connected with saturated steam. They will not work properly with superheated steam.

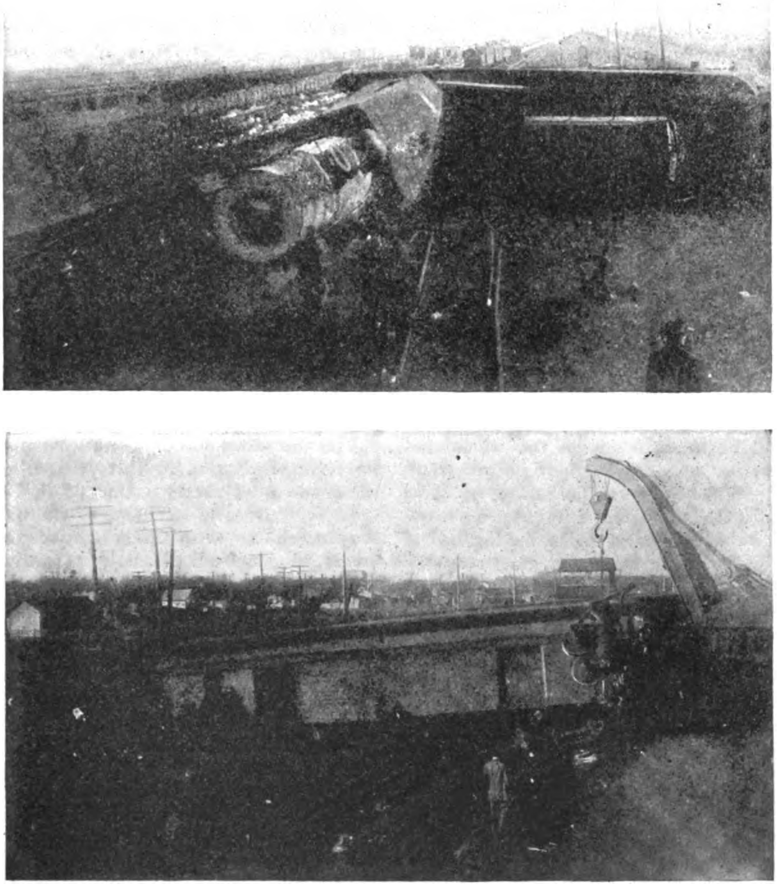
In addition it is recommended to every member of this association to read the report of the Committee on Superheating as submitted to the last convention of the American Railway Master Mechanics' Association.

In concluding the report, which states only facts obtained from the different interested railroads, your committee has in a brief and concise form suggested recommendations arrived at from such facts, which to amend is left to your consideration.

The committee consisted of: Max Toltz, chairman; D. C. Buell, J. P. Ferguson, and J. H. Maysilles.

Wreck on Union Pacific.

Herewith are shown illustrations of a wreck which occurred at North Platte, Neb., January 26, 1909, on the Union Pacific Railroad. Train No. 11, known as the Colorado Special, which is said to have been running at a speed of about 30 miles per hour, was derailed by a broken switch rod. There were eight cars in the train, two of which turned over with the engine. Our correspondent states that both the engineer, Mr. S. Schwager, and the fireman, Bro. Jesse T. Berry, of Lodge 28, B. of L. F. and E., attempted to escape by means of the running board. The engineer succeeded in getting off without injury, but Brother Berry got no further than the front cab window and was killed.



WRECK ON UNION PACIFIC RAILROAD, AT NORTH PLATTE, NEB., JANUARY 26, 1909

Safety Appliances.

Probably the best legislation affecting transportation lines was the Safety Appliance Act. Because of the expense involved, there was objection on the part of railroads to its application, but, like all generally applied laws, the minor objections were outweighed by the benefits. It is undoubtedly true that the enforcement of the law as to automatic couplers and air brakes has made possible the handling of larger tonnage units with greater safety, both as to lives and property. There is still too great a sacrifice of life and limb involved in the handling of trains, especially in yards and local freights, and great improvement can and should be made in this direction. The blame for this danger lies jointly between the railroads and their employes.

Familiarity with danger always causes an indifference, and even contempt for same, resulting in the taking of unnecessary risks. These risks eventually result in accident to the employe and usually cost the roads much money for damages. Their avoidance can be brought about by co-operation of railroads and employes. Railroads for their own protection should promulgate and rigidly enforce such rules as will prevent unnecessary dangers, such as going between moving cars to adjust couplers, etc. The disciplinary methods for enforcing such rules should be as rigid as those involving train movements. Employes, for their own protection, should be brought to see the wisdom of such rules and aid in their enforcement. The occasions where the taking of these risks will save time are rare, as ordinarily they can be avoided by the use of a little judgment and foresight, which effort, on the part of employes, should be insisted upon. When, unavoidably, it becomes necessary to go between cars, it should be the invariable rule to bring them to a stop. The small loss of time involved is in no way commensurate with the danger to be avoided.

Although M. C. B. automatic couplers have been in universal use now for some years, there is still much to be done in perfecting their application and use before the dangers of switching are properly reduced. It is hardly to be expected that the work of men so employed will ever be classed as extra favorable risks by accident insurance companies, but a comparison of American and English statistics as to accidents in this department is a serious reflection on American methods. English cars are coupled with chains and hooks, which can only be operated when cars are standing, and the result is that men employed in coupling and uncoupling them are rarely injured. As a result, a committee from the Board of Trade reported adversely to the adoption of automatic couplers of the type used in the United States. The fact that English roads find it possible to move a large amount of tonnage in cars of small capacity shows that it is possible to avoid the dangerous haste of our methods.

While employes are undoubtedly to blame for much of the danger involved, the railroads are still very derelict on their part. If it is found desirable to keep up the present rapid pace, couplers should be used with devices to throw open the knuckles with the operating levers, and locksets should be universally used. There are several designs of couplers made with these features, and more would undoubtedly be brought out if these requirements were rigidly insisted upon. The additional expense is nothing, so that all that is required is action. Hence there does not seem to be any excuse for delaying. Occasionally one coupler is defective and it is found necessary to use the other, involving the crossing of tracks. This can be avoided by the use of levers reaching both sides of the car, and so long as there is likelihood of such failure, the use of such uncoupling levers should be required. It would seem that the M. C. B. Association could well reconsider its recommendation in this particular in the interest of safety. One of the most fruitful sources of accident is the breaking of chains, clevises and uncoupling levers, due in most cases to faulty or weak design. When it is realized that these parts cost so little and that the use of those of stronger design adds only a few cents and a very few ounces to the cost and weight of cars, there does not seem to be any excuse for such failures. The strength of materials is a matter of general knowledge, and experience has long ago shown what is proper in the matter of designing these parts. In view of these facts, it is an evidence of dereliction, on the part of those responsible, for the inspectors of the I. C. C. to report such defects as uncoupling devices not operating and for the courts to have sufficient evidence to impose fines for such failures. Also, the fact that the M. C. B. Association is still wrangling over the size and design of chains and clevises, with no apparent progress, shows that this body needs some prodding. Uncoupling devices can, and should, be made strong enough to withstand any strain except pulling out of drawbar, and even in this case, they can be designed so as to uncouple and sustain the broken drawbar. Anything short of this result is insufficient and defective, and procrastination in the universal adoption of same is causing the loss of lives and may ultimately bring about more drastic legislation to enforce an improvement. There is still another danger in handling of freight trains, that of going between cars to couple and uncouple air hose. Congress has ample power to require a decided improvement in this matter, and doubtless will ultimately take action. It should not be necessary for such legislation to be passed in order for railroads to improve their methods; and it behooves them to get very busy on this line.—The Railroad Herald.

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The Railway Locomotive.

The above is the title of a new book by Vaughan Pendred, M. Inst. Mech. E. M. I. and S. Inst., and published by D. Van Nostrand Company, New York. It is divided into three sections, as follows: Section I treats of the locomotive engine as a vehicle, and contains chapters on frames, bogies, the action of the bogie, center of gravity, wheels, wheel and rail, adhesion, propulsion, and counter-balancing. Section II treats of the locomotive as a steam generator, and contains chapters on the boiler, the construction of the boiler, staybolts, the firebox, the design of boilers, combustion, fuel, the front end, the blast pipe, steam, water, priming, the quality of steam, superheating, boiler fittings, and the injector. Section III treats of the locomotive as a steam engine, and contains chapters on cylinders and valves, friction, valve gear, expansion, the Stephenson link motion, Walschaert's and Joy's gears, slide valves, compounding, piston valves, the indicator, tenders, tank engines, lubrication, brakes, the running shed, and the work of the locomotive. In the back of the book is given a list of standard works on the locomotive engine and an index.

The author in his introductory, among other things, says: "The 'Westminster' series is intended in a sense to bridge over the gaps left by specialization. Thus the marine engineer may have but a very slight knowledge of electrical engineering, and the civil engineer may be comparatively ignorant concerning the locomotives which run on the railways which he makes. But engineers should have—the younger members of the profession in particular need to have—a great deal of information in common, and all perfectly understand technical language. . . . The books which have hitherto been written about the locomotive engine are all either strictly specialized or very 'popular.' None of them go far into the life of the locomotive engine. The technical treatise deals with the locomotive almost altogether as a machine. Its parts are described, but the reasons why they assume particular shapes, and why one shape is better or worse than another, are not dwelt upon, and nothing is said about the daily life of the engine. To use a metaphor, the locomotive is handled by its authors anatomically, not physiologically.

"I have in this volume attempted, I hope with some success, to break new ground. . . . My purpose has been to make the locomotive intelligible; to show what it means; the mechanical and the physical phenomena on which it depends for its action, and the objects carefully kept in view by those who design, construct, and employ it as one of the most useful servants of mankind. I do not think this has been done before with anything like the same simplicity of intention.

"I have treated the modern locomotive from three points of view, namely, as a vehicle, as a steam generator, and as a steam engine. A certain amount of overlapping is unavoidable, but it will not confuse the issues. . . . Finally, I may say that in writing I have carefully kept in view the needs of the student. I have endeavored to make the study of the locomotive attractive. Unfortunately, it lends itself in many ways to mathematical treatment; and the mathematics of the locomotive are very far from being a good introduction to its study. It may be added that in practice they play but a secondary part; and this principally because they do not always fit in with existing conditions. . . . I have endeavored, as I have said, to tell my readers what the modern locomotive is and why it is what it is. For this purpose I have only required a comparatively small number of diagrams, and I have not illustrated any types of locomotive. Photographs will be found of these by the hundred in other volumes, where they serve a good purpose no doubt. They would be superfluities in this book."

The book is well written, but deals more particularly with British locomotive practice, and while, therefore, it is not applicable in all respects to American usages, it is nevertheless a valuable treatise. It contains over 300 pages, 5½ by 8 inches, bound in cloth with gilt title. Price $2.00 net. Published by D. Van Nostrand Company, 23 Murray and 27 Warren streets, New York, N. Y.

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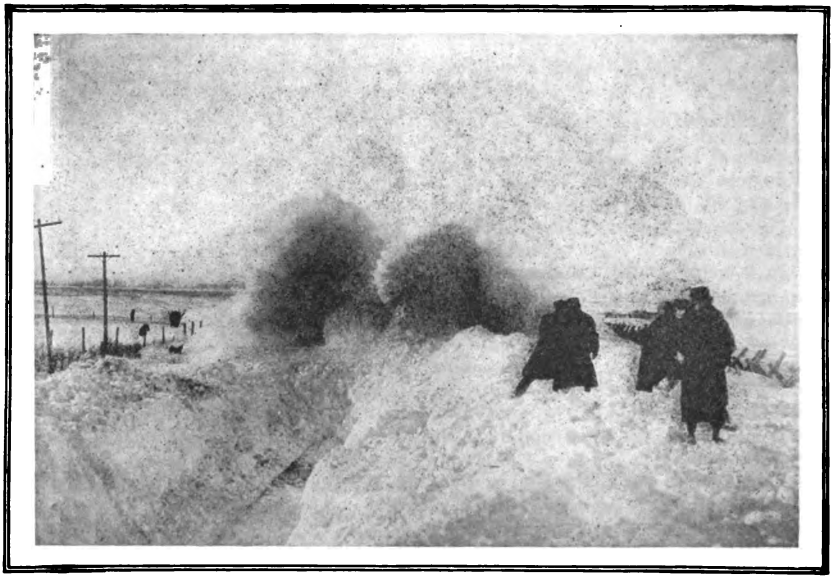

BUCKING SNOW ON THE C., M. & ST. P. RY.

Locomotive going through snowdrift twelve feet deep, near Scotland, South Dakota, February, 1909

(Photo by Bro. J. O Mason, Lodge 79)

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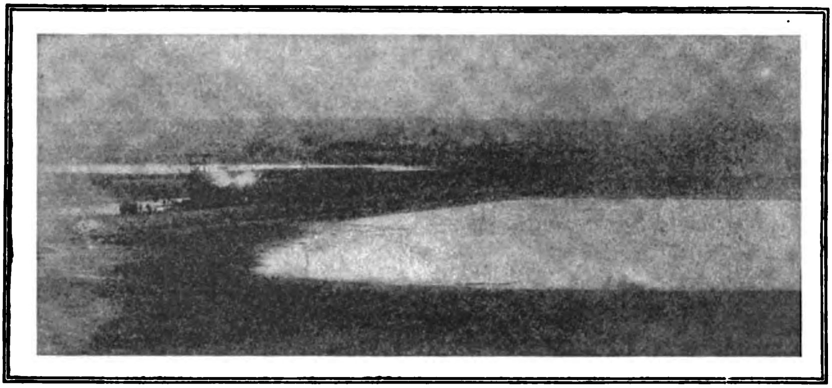
Echoes from the Firing Line

Track-Laying on the Grand Trunk Pacific.

Herewith is shown a small picture of the track-laying outfit on the Grand Trunk Pacific. It is constructed on a flat car, as will be seen in the picture. The steel is on cars ahead of the engine, while the ties are on cars behind. Trams are fastened on each side of the cars, the steel trams being on the left side and the tie trams on the right, running back about ten car lengths behind the engine. On the Pioneer there is an engine and an air pump, the steam being taken from the locomotive through a pipe which runs along underneath the steel trams. The air pump supplies air for operating the hoisting cables in handling the rails. Four men are employed to each rail, while about twenty men handle the ties. The rails are held in place by four bridle bars, and when placed in position and the train moves ahead the spikers follow up behind the train, there being about 150 spikers. The train itself runs over the rails just laid and held together by the angle bars and the bridles.

The engine used for this work is one of the large consolidation type and carries 200 pounds steam pressure, and when the supply of steel is kept up to sidings behind they are able to lay about five miles of track per day, which is considered pretty rapid work.

W. J. FEATHERSTONE.



TRACK LAYING ON GRAND TRUNK PACIFIC RAILWAY

Superiority in Steel Manufacture.

I have read with much interest and pondered over an article in the December, 1908, issue of the B. of L. F. and E. Magazine beginning on page 808, entitled, "Concerning American Railway Management," and still another one in the January, 1909, issue, beginning on page 12, entitled, "Some Features of the Present Steel Rail Situation," both reproduced from "Engineering News."

The first article is further proof of the "uphill road" the inventor has to travel, and the greater the invention the harder it is for him to get it adopted satisfactorily and honestly, and receive in return a just share of the profits accruing therefrom, as nearly all past experience proves. The second article shows that there is today throughout the engineering departments of the railroads especially "a crying need," as Mr. Dudley puts it, for a steel that can be rolled into rails that will overcome the very many defects of the steel now used for that purpose, to the end that the immense amount of property loss, loss through lack of proper wearing quality, loss of life, etc., may be reduced, thereby saving millions of dollars yearly to the railroad companies throughout the world. This subject is of vital interest to every engineman and trainman riding over steel rails, and I am prepared to prove—yes, *prove*—that some of the leading steel rail manufacturers of this country apparently do not want to make a better steel rail than now in use, for at least two of them through their general managers, aided by their chemists and metallurgists, turned down and almost kicked out of the plants under their charge the inventor of an entirely new process for treating steel in any kind of a furnace now in use, simply because he made in said plants a steel as far superior to what they made as their own make is over the best pig iron, apparently because they could not take his process from him or buy it for a trifle, and then report to their employers that *they* had the *only* perfect process for commercial steel making.

This inventor a few years ago interested a very wealthy man, who was a large steel user, in his process, and made a heat in a plant in Pennsylvania from which an ingot was taken for a comparative test with steel made in said plant, and proved all he claimed for his steel. The death of that wealthy man is the reason we are not getting today "perfect" steel in our rails, and for all purposes—a steel composed of "iron and carbon" with the effects of other ingredients so completely allayed, such as sulphur and phosphorus (the arch enemies of steel), that no ill effect whatever comes from them, and a steel free of blow-holes in ingots or castings and having about fifty points of actual superiority over its competitors made in the open hearth or acid furnace or Bessemer converters of today.

Almost any one that should read the assertions I have made would say, "Why hasn't that inventor succeeded before this in getting his process adopted?" I'll tell why. He has tried to reach the owners or head ones of various large plants and lay before them his claims for his process, and if they "condescended" to listen to him would soon say, "Go to the manager of the plant I am over and prove to him (if he'll let you) that you can do what you claim, and if he reports favorably I'll do business with you." I ask would a manager of a steel works, together with his chemist and metallurgist, "report" to those they work for that another man, a stranger, had made steel in their plant free of blow-holes and having so many actual points of superiority over the way they treat and make steel? If they did wouldn't they be apt to lose their positions and the "stranger" get the job?

The inventor of said process is a "steel expert," but, like most inventors, a poor inventor, and he has been fooled by more than one dishonest promoter during the past few years. The few "facts" herein stated may be read by some man or men who later on may provide the necessary money to manufacture steel by the process of which I write, and when such steel is rolled into rails and put into the very many parts of a locomotive to which it is adapted the enginemen of the future will have a far easier row to hoe, and many lives will be saved that are now sacrificed annually through defective steel in rails and engines.

H. A. DECKER.

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Service Applications of the Air with Long Freight Trains.

In a recent article appearing in the Magazine it was recommended that in service braking with long freight trains, no matter how the all-air train was made up, to never make less than a 10-pound reduction, and as much greater than that as the circumstances might warrant, and examples were given to show that in making a brake application on a long mixed train it was possible to lessen the inequality of braking forces between the loaded cars ahead and the empty cars at rear end of train by the use of heavy initial brake applications.

It was also stated that one road had ordered that not less than a 15-pound initial gauge reduction should be made, and it was further recommended that when starting out with a mixed train of empties and loads, initial service applications of 10, 15 and 20 pounds, respectively, should be made under like conditions and the results compared, when one would be enabled to judge as to which is the least productive of heavy stretching effects and the safest method of operating the braking forces of long trains. Such reductions not to be made as early as is usual with lighter reductions, but nearer to the place where it is desired to stop.

Mr. Blackall, in his 1907 edition of the Air Brake Catechism, advises against too light a reduction on long trains, but I fail to find where he recommends a 20-pound initial reduction.

Suppose we take a 50-car train with air brakes in perfect condition, 20 loads on head end and 30 empties on rear end, and say these 50 cars have a capacity of 60,000 pounds each and a light weight of 28,000 pounds. We will say that these cars are braked to 70 per cent. of their light weight with 70 pounds brake pipe pressure. This train is not supposed to have any leaks, so we have the same brake pipe pressure throughout the train, and we have automatic slack adjusters and the piston travel in all brake cylinders is 8 inches.

We now make a 10-pound reduction and get 23½ pounds pressure in each cylinder. This would give us 1,181.31 pounds pressure on cylinder levers, and say the brake leverage was 6.53, this would give us 7,711 pounds braking power on each car. On the loaded cars at the head end of train we have 7,711 pounds divided by 88,000 pounds (the gross weight of car and load), or 8.76 per cent. braking power. On the empties at rear of train we have 7,711 pounds divided by 28,000 pounds (light weight of car), or 27.54 per cent. braking power, or 3.03 times more power on empties than on loads. But the point to get at is the difference between braking power on loads and empties, and this is 27.54 ÷ 8.76, or 18.78 per cent.

We now make a 20-pound reduction and get 50 pounds pressure in each cylinder, or a force on cylinder levers of 2,500 pounds, and with cylinder leverage of 6.53 a braking power of 16,325 pounds on each car. With loaded cars this would give us 16,325 ÷ 88,000, or 18.55 per cent. braking power, and on the empties it would be 16,325 ÷ 28,000, or 58.1 per cent.

The braking power is now 3.18 times greater on empties than on loads, and the difference between braking power on empties and loads has risen to 39.55 per cent. This is the most favorable side of the heavy reduction, and so far the case is against it.

We now take the 50-car train as we find it in actual service with the 5-pound excess pressure on head end. We couple onto one of these trains and after having tested the brakes the car men come over and tell us the train line is tight and the travel good, but the pump keeps on working at a fair rate of speed, so we don't believe in this perfectly tight train line. There must be quite a number of small leaks that the train and car men did not hear in passing, and as the 5 pounds excess is maintained by air feeding through brake valve to supply leaks suppose we now lap the valve. The tendency now is for the air to equalize throughout the train, but suppose we immediately draw off 10 pounds as shown by the gauge when air quits flowing at the exhaust. If the air had been 5 pounds less at the rear end we would have only drawn 5 pounds brake pipe pressure from rear end to the 10 pounds at head end. If the fall in air pressure had been 5 pounds on a 50-car train it would be a fall of 1 pound to each 10 cars, and the brake cylinder pressure on the head 10 cars would be 23½ pounds, while on the rear 10 cars it would not be over 10 pounds brake cylinder pressure, or a braking power of 11.6 per cent., and as the 10 head loads would show a braking power for a 10-pound reduction of 8.76, this would leave only 2.84 per cent. difference between the 10 head and 10 rear cars.

We now make a 20-pound reduction. The head end is charged to 70 pounds and the rear end to 65 pounds. We only get an actual reduction of 15 pounds on rear end and a brake cylinder pressure not to exceed 40 pounds, or 46 per cent. on the 10 last empties, while on the head 10 loads we have for the 20-pound reduction only 18.55 per cent. braking power, and from the difference of 2.84 per cent. braking power for the 10-pound reduction we have risen to 37.45 per cent. difference for the 20-pound reduction between the loads on head end and the empties on rear end, and as a multiple it has increased from 1.32 times for the 10-pound reduction to 2.42 times for the 20-pound reduction between empties and loaded cars.

Suppose we are coming to a station stop or are going to head in at a switch, and we wait until the last minute and make a 20-pound reduction, and we see that we are going to run by; we are already all in and have the privilege of backing up later on. On the other hand, if we take plenty of time and make a 7-pound reduction, if we are approaching the desired stopping place at too high a speed there is sufficient reserve in the auxiliaries to stop at the required place. If stopping short with heavy reductions it is not safe to release when the mistake is discovered, but if stopping short with a 7-pound, or light, reduction the brakes can be released at low speed, and even if a few do stick they are not set hard enough to damage the draw gear.

Another matter that should be taken into consideration is the effect of a dirty triple valve. You may make a 7-pound reduction with one of these in the train and the brake does not work; with a 10-pound or heavier reduction it comes over with a jump, and if it happens to be on the rear end of a bunch of empties with loads ahead there is no way of preventing a draw gear accident.

There used to be a rule in one of the old books of rules (I believe it was the Santa Fe) which said in effect to "approach stations carefully and not endeavor to make fancy or exhibition stops." This was a good rule as well as sound air-brake practice. In my own personal experience I have taken the whole end out of a car coming into town, and on the last minute, making one of those 20-pounders. MEMBER 503.

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Compounds and Self-Dumping Ash-Pans.

While looking through the January number of the Locomotive Firemen and Enginemen's Magazine, which I enjoy reading very much and take a great deal of interest in, I noticed quite an article in regard to the attention given by traveling engineers to their divisions, engines, crews, etc. When I read this article and studied it carefully I concluded to write something for the columns of the Magazine in regard to the conditions existing on the division where I am employed. In the first place, I have fired here almost three years, during which time I have seldom seen a traveling engineer. We have a traveling fireman also, but have never seen him out on the road nor on an engine.

Relative to that part of the article which suggests the amount of mileage which should be assigned to one road foreman, would say I do not believe our foreman has anything near the limit. The division of which I am writing has only about 364 miles. There are about thirty crews and about that many engines. Of course there are extras at times when business demands. I do not think there is a division on the entire system where the motive power is poor, and if a man gets on a good steaming engine he wants to sleep there for fear some one will bump him off. Our coal is the poorest that was ever shoveled into a locomotive firebox. It is piled on the tenders in chunks weighing from five to fifty pounds, and sometimes we have coal picks and sometimes we have not. So one can plainly see what some of the boys on this division have to contend with.

About one year ago the company gave us compounds. None of our engineers had ever run a compound before nor had any of them been examined. Even though we have a fine lot of engines, with good men on them who are careful and know how to railroad, these men were up against a proposition when those engines came and have been since. Why, when we are out on the road working steam and see a mile board it almost scares us, the engines are so entirely enveloped in steam. I never was on one that didn't pound so one could not sit down. The engineers all stand up; they can't sit down. If they did, about one trip per week would be all they could stand. I wonder what our road foreman would do if he had 700 miles of road, 125 engines and 175 crews to look after. I am inclined to think that if our foreman would give our engines more attention we would be able to get more work done on them. I know one engine that had a fair overhauling and doubled the road 100 miles every day for twenty-four months on passenger, and then the official wanted her to "just make one more trip." I know another engine that ran on way freight for twenty-four months, never lost a trip, then got a $1.98 overhauling and came out of the shop in almost as bad shape as she went in, but, alas, she is in again after working four weeks.

I have been wondering what our company is going to do about the automatic self-dumping ash pan. No effort is being made to equip the engines, and we have quite a number of the seventeen-inch Rhode Island type that need to have the ash pan cleaned about every fifty miles. Of course we would like to see the self-dumping pans put on these engines. Many of them have been shopped since the ash pan law was enacted, but no effort has apparently been made to comply with the law, which I understand goes into effect January 1, 1910, but perhaps it is the intention to shop these engines again before that time. I have watched the Magazine closely for something about conditions on this division for over a year, but have seen nothing. If any one has anything to add to what I have written would be pleased to read it in the columns of the Magazine.

FROM A FIREMAN.

Technical Contributions

WHY THE WHEELS STOPPED TURNING
(BEFORE THE TRAIN STOPPED)
OR
THE MYSTERY OF THE SLID-FLATS*

BY WILL W. WOOD

The instructor had put up some pretty good object lessons concerning the sliding and flattening of wheels where we enginemen were to blame, and was about to turn his attention to those cases wherein the fault lies elsewhere; but there was some curiosity among the fellows as to why the instructor had claimed that a report that "brakes were not properly adjusted" should never be resorted to as an excuse for wheel sliding; and in reply to a question from one of them he said:

"The only 'adjustment' of the brakes—meaning the foundation brake, or rigging—that it is possible to make by hand is to take up the slack in it by means of the *dead truck-levers*, of which there is one at each end of the car—one for each truck; in the shop, a readjustment is possible by drilling the holes in the brake levers at different points for the rod connections. Improper adjustment as it could possibly apply in cases coming to your notice could only refer to two conditions, one of which is that the slack in the brake rigging has been so completely taken up by shift of the fulcrum pins at the top ends of the dead truck-levers; or by changing the connection of the bottom ends of the dead levers to other pin holes in the 'bottom truck-rods' so as to change the effective lengths of the latter—to lengthen them, usually, with inside-hung brakes, and to shorten their lengths with outside-hung brakes; and the other condition is where the slack has been taken up as described, but only at one truck, under which circumstance it is possible that the brake of the car will only apply at one truck—the end at which the slack was taken up—while the brake beams of the other truck may not move—the shoes hang away from the wheels.

"Under the first condition, the only effect of the 'adjustment' will be to make the piston travel exceedingly short, and in such cases you should simply report the short piston-travel, giving distance, and never minding the 'adjustment.' It is the erroneous impression among many men that under the second condition the truck brake that does apply has the combined power that should go to both truck brakes, when as a fact it only gets its own one-half of the total braking power, no matter whether the other truck brake sets or not. What becomes of the other one-half of the whole braking power, you ask? Is it lost? No, nothing in nature is ever lost; the long take-up at one end of the car draws the whole set of gearing toward that end, until the 'floating lever' near the opposite truck strikes the end of its carrying iron, and stops; when the air or hand brake is applied one-half of the power goes to the four brake shoes at the taken-up end, and the other one-half goes in the opposite direction as far as the floating lever, terminating in the stress of the carrying iron.

"That represents the very worst case of improper adjustment, yet if the wheels skid at the taken-up end the cause must be looked for as other than the fact that the brake of the other truck didn't set. The slack should be taken up equally at each truck—and these instructions refer to *tender* as well as *car brakes;* but if the slack should be taken up unequally, as long as none of the levers become fouled there will be no material difference in braking power as the result, except that represented by the difference in piston travel, because the foundation brakes of the two trucks equalize with each other; and remember that when a lever fouls, its power is not dead but is exerted at the fouled point instead of being carried further."

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*Continued from last month's Magazine.

Then the instructor reverted to the main subject. Said he:

"The last trip that I rode on freight was out of here, with 55 cars and the caboose, all air. The hind man was an old-timer, but the head brakeman was a new one, a young fellow not long from 'that little isle so green,' but a willing youth. The engine had been coupled to the train for quite a long while when I arrived at the head end; the pump was batting away at about 120 single strokes a minute, and the engineer and conductor were standing 'longside the engine ready to start as soon as the air-brake inspection was completed.

"'What's the delay?' I inquired of the conductor.

"'Got a heluva bum train line,' he explained; 'can't get the air thick enough for test. Both brakemen supposed to be working on the leaks, but my hind man, Bud Weiser, thinks the train line's a live wire. Bo—he's laying off, and I've got a green man head; Bo Hemian's a beautiful thing on air—if he can't find a leak, he'll make one.'

"Finally the engineer figured that he had enough air for test, and he made a heavy application; just as soon as the hind man saw the caboose brake go on he started wig-wagging the signal for release; the amount of excess pressure in the main reservoir was only that which had accumulated while the brake was on, but when the engineer put the brake valve in release position the brakes began to whistle off, prompt, and the hind man again wig-wagged tidings; meaning this time that the brakes of the train were—or should be—released, because he had witnessed the releasing of the caboose brake; nevertheless, the conductor said *go* and we went.

"Now that was a mighty poor test, but as the conductor said, they had their orders—including meeting points—the train was ready to go except for the air-brake tests—repair work should be done before cars are placed in a definite train; it takes a long time to completely inspect the air on 55 cars after the brake is set, and then to go over the whole train again after the brakes are released; the test as made showed that all angle cocks were open between the cars; the yardmaster and train dispatcher were impatient for us to get out of town, and—we got out.

"It's almost level track—a gradual fall—for four miles out, and then comes a heavy up-grade, and we had a pusher engine behind. The conductor and I got on the engine at the head of the train. The two engines were working up a pretty fair speed about a mile out of town, when the engineer and conductor got their heads together and concluded that we were not going fast enough—that a brake was stuck—maybe two brakes a-dragging; well, when we struck the grade the conductor and hind man were both out on top, and as soon as the speed was slow enough they were off, running along the train and evidently bleeding auxiliary reservoirs; we nearly hung up, and they kept trotting along the train with their eyes on trouble of some kind, and when half of the train was 'on our side of the hill' and the helper engine had cut off, we got a signal from the con. to stop, and I dropped off to investigate.

"There were two cars with slid-flat wheels, and on one of them the brake was still stuck, although Bud had held the bleed cock open until he was tired. Just as I came up Bud evidently thought of something, and walked toward the end of the car and I followed him; Bud climbed up and *turned down the retaining-valve handle* and the brake released.

"Suppose I hadn't been there," suggested the instructor; "see how easy all fault on the part of the trainmen was removed; no evidence remaining but the flat spots; and then what? Carelessness on the part of the engineer, no doubt.

"The conductor had found the wheels of the other car sliding, but when he gave the first jerk to the release-valve rod the triple valve released the brake; so I was anxious about this case, and we signalled the engineer to apply the brakes. I had noticed that the shoes were hugging the wheels unusually close, and when the air went on with a 15-pound reduction—sure enough, it only forced the piston rod out of the brake cylinder 4½ inches. It was a new car, the brake beams were hung between the wheels, and one would imagine that they would be suspended from lugs on the truck columns, as is the case on most cars, so that the brake shoes will always hang at the same distance from the rails; but on this new car the brake-beam hangers were attached to the spring cap, with the result that the beams were depressed when the car settled down under a load; the slack of the brake rigging had evidently been taken up under load, and as the car was now empty its rise had pulled the shoes still closer to the wheels, with the effect of automatically taking up the slack right at the brake shoes, which as is generally known shortens the piston travel wonderfully.

"As the result of this, at the test application before leaving the terminal the auxiliary reservoir and brake cylinder on this car equalized at a much higher pressure than any of the rest; with his main reservoir pressure not yet up to the maximum, when the engineer attempted to release, the brake-pipe pressure could not be raised greater than that in this auxiliary reservoir, and the brake remained set; of course, the brake-pipe air was finally pumped up to 70 pounds, but it is seldom that the pumping-up of air in a long train line—including nearly all of the auxiliary reservoirs, too—will increase the pressure rapidly enough to release a stuck brake; usually the excess of brake-pipe pressure will feed right past the triple-valve piston.

"'Say, Micky—see that short-horn—see that piston under there?' inquired the conductor. 'Yuh do. Well, you fall under there and lengthen it out to about 7 inches. Hurry up, we've got a hot box back there; Bud's gone after the dope bucket and you'll have time if you hustle,' and we walked back down the line looking for further trouble.

"After Bud got through and started back to the caboose with his hot-box medicine, the con. and I retraced our way to the engine, and when we drew near to the car of the short piston-travel Micky McAdoo crawled out from under it and seated himself on a tie with a disgusted expresson on his face. 'Well, how're yuh fixed, Mickydoo?' inquired the conductor. 'Got her lengthened?'

"''Tis welded,' was Micky's reply. ''Twas made in Pittschburg; it cannot be lengthened.'

"When we pointed out a dead lever to Micky and told him to change its fulcrum pin a couple of holes further away from that pair of wheels, he caught on all right and let out the other truck brake in the same manner, and we proceeded—with our two new items of expense pounding along as reminders of the money that is saved to a railroad company (?) in disallowing the time necessary to make a thorough test of the air brakes before a train leaves a terminal station. But it wouldn't do to lay the blame for this latter case of slid-flat wheels to the Transportation Department; lay it to the engineer's lack of judgment, for he may not be well enough posted to defend himself.

(To be continued in the May number of the Magazine.)

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ELECTRICAL RAILROADING

BY ELWOOD GRISSINGER

Sparking at the brushes of a dynamo or a motor may be due to any one of a large number of causes, only a few of which have been mentioned. The following causes in addition to those already outlined may be urged as worthy of being clearly understood and remembered: Weak magnetic fields, grounded armature coils, unequal strength of the magnetic field as distributed between the field poles of the machine, vibration of the machine, an open circuit in the armature winding, short-circuited or reversed coils in the armature winding.

The weakened magnetic field was dwelt upon sufficiently in the last preceding paper in so far is it referred to the attempt to regulate the speed of a motor by changing the strength of its magnetic field either manually or automatically. A common cause for a weakened magnetic field other than the above is often found in a short-circuited winding. A number of turns of wire wound about any one of the field poles may become ineffective by reason of the field current short-circuiting around them, thus reducing the number of active turns of wire in use around that particular field pole. This means a reduction in ampere turns for that particular field coil and pole, and consequently a weaker magnetic field at that particular point. In general, a short circuit is confined to but one such field pole, weakening such a pole in distinction to the others of the machine.

There are different ways of determining whether or not a field coil is short-circuited, without removing the coil from the machine or without removing any of the wire from the coil. A simple method though one requiring careful judgment, is that of testing the strength of the adjacent field poles when the current is passing through the field winding; by holding a small piece of iron between adjacent poles. The small piece of iron will be attracted more strongly to the pole piece which induces the stronger magnetic field. The force of attraction for the small piece of iron should be the same if the strength of the magnetic field is the same for the two poles being examined. This test should not be attempted without raising the brushes from the commutator and connecting the field coils through a resistance with the supply circuit, should the motor be series wound. If the motor is a shunt-wound motor, the use of a resistance can be dispensed with. All street railway motors of the direct-current type are series-wound. The field circuit of a shunt-wound motor can be directly connected to the supply circuit.

Another method of ascertaining whether or not a particular field coil is defective to the extent of weakening the magnetic field is to test its electrical resistance by comparison with other coils upon the same machine or by comparison with the standard of resistance for the same type and class of motor if such standard is known. When making such a test, the coil whose resistance is much lower than that of its mates is the one to look to for the cause of the trouble. The resistance of any coil of wire can be found by the drop-of-potential method and reverts to a fundamental law laid down in an earlier paper. It was stated that $C=\frac{E}{R}$, where C represents the strength of the current in amperes, E the pressure in volts and R the electrical resistance in ohms. By transposing the equation, we have $R=\frac{E}{C}$. Therefore, if a voltmeter be used for measuring the volts pressure across the terminals of the coil and an ammeter is used for measuring the number of amperes of current flowing in the coil at the time the pressure is measured with the voltmeter, then the quotient obtained by dividing the volts pressure by the current in amperes will represent the electrical resistance of the coil in ohms. This is true no matter what might be the strength of the current in amperes flowing through the coil or what may be the voltage of the current used in making the test. Either or both of the known quantities in the equation may be large or they may be small, so long as a true measurement of the respective quantities can be made.

In the case of series motors, however, it must be remembered that the electrical resistance of them is very low and that therefore a very low voltage should be applied unless an external resistance be connected in series with the coil to be measured. In performing this test, it is not necessary to disconnect the field coils from the machine or from one another so long as such coils are connected in series. An ammeter is merely connected in series with the field coils. This ammeter so connected will measure the total current which is passing through the circuit within which it is placed. The same current strength will be passing through each and every coil. In the use of the voltmeter, however, it should be connected with two flexible leads of insulated wire. Two of the free ends of the flexible wire are fastened to the terminals of the voltmeter and the other free ends are attached to the terminals of the field coils or other class of coils, the voltage across whose terminals it is desired to obtain. By attaching the voltmeter leads to the different coils and taking readings of the voltmeter scale, it will be possible to get a record of the drop of potential across each such coil. Then, knowing by measurement of the current strength in the circuit as taken from the ammeter, the resistance of the coil is readily calculated by means of the formula already given.

Another indication of a short-circuited coil in the field winding is to be found in the heating effect. A field coil with a short circuit in it will heat less than the perfect coil, because its resistance is less than that of the other coils and there is therefore less energy dissipated in the form of heat.

A weakened magnetic field may further be due to a grounding of the field coil or coils upon the core of the field poles and therefore a grounding upon the frame of the machine. This may affect three out of four coils of a street railway motor by cutting them all out of circuit, or it may only affect the grounded coil. In general, it will render the motor inoperative until the grounded coil is repaired. Such a defect can be located by means of a magneto testing set. Such a set is nothing more or less than a ringing generator such as can yet be found in some telephone line stations, where it is necessary to ring a bell to call a subscriber. Remove the brushes from the commutator of the machine when testing for such a ground by means of the magneto, keep the supply current off and connect one terminal of the magneto to the frame of the motor and the other end of the magneto to the one end of the field coil. If the bell rings, there is a grounded connection between the field coil windings and the frame of the motor. It will then be necessary to disconnect the field coils from one another, one at a time and test each coil separately until the one is found that causes the bell of the magneto to ring when the connections of the magneto are made to the individual field coils as already indicated. When the defective coil is removed from the machine, it may be found that it can be repaired by inserting mica as the insulation at the point of the grounding of the coil upon the frame or field pole. On the other hand, the coil might be found to be in such a condition as to require the insertion of a new coil in its place. When the new coils are so placed, it must be ascertained that the new coils are of the same electrical characteristics as the coils which have been removed for defect. These characteristics include the size of wire in the coil, the number of turns of wire in the coil and its electrical resistance in ohms.

The reason that a single grounded field coil of a street railway motor may cut out from one to three field coils is because all street railway systems are grounded to the rail, i. e., the rails of the roadbed form a part of the electrical circuit. In the case of shunt-wound motors, however, more than one field coil would have to be grounded before the defect would probably be noticed, unless, perchance the supply circuit were likewise grounded and the motor frame were either purposely or accidentally grounded.

It now and then happens that a new motor will be received in which one of the field coils may be connected in inverse order to what it should be when considered in relation to the remaining coils of the set. This would bring two N poles adjacent to one another in the field magnetic circuit. A reversed field coil would come under the head of a weakened magnetic field, because the effect produced would be the same. Field polarity can be tested out by means of a pocket style of compass. With some current passing through the field circuit, the compass should reverse itself when brought near to adjacent field poles. All that it is necessary to do when the crossed field coil is located is to disconnect it from the others and reverse the order of its connection in the field circuit.

Armature coils may be grounded to armature core at one spot or more. In the case of generators not in use upon railway circuits, a single ground of this nature will not cause difficulties in operation. It requires more than one grounded armature conductor in machines of this class to bring about noticeable sparking at the brushes. Railway motors and generators having one side connected to the ground through the rail present different characteristics. A grounded coil on armatures of this class of machines will permit the current to flow through such fault to the rail circuit or vice versa, as the case may be, depending upon whether the trolley wire or the rail is made the conductor for the return circuit. Grounded coils of this kind cause considerable sparking and also bring about a variation of the motor torque at different parts of the revolution of the armature, causing its speed to vary as the grounded coil passes from one pole to another.

A magneto testing set, already referred to, is a positive and rapid device for locating such faults. The drop-of-potential method can also be employed. Another test which can be applied very nicely to armatures for locating grounded coils consists in removing the brushes from their respective brush holders and then tying a piece of bare copper wire around the commutator in such a manner that it will make positive electrical contact with every segment of the commutator. Then connect a source of current supply to this band, attaching the other terminal of the same source of current supply to the shaft of the armature. The current from this source of supply will pass through all of the armature coils and will leak through the grounded armature coil or coils to the armature shaft. In doing so, the current will create a magnetic field at the point in the armature core where the armature coil or coils are grounded. This point can then be located with a small compass or with a small piece of magnetic material held in the hand and moved around and about the surface of the commutator. A current of low voltage must be used in making this test, and if a low voltage is not obtainable, then connect incandescent lamps or some other form of resistance in series with the testing circuit.

It is sometimes possible to remove the ground from an armature coil by raising the coil from its slot and inserting mica insulation, replacing the coil, though in general a new coil must be inserted. Sometimes a ground will appear in armature coils and disappear by "burning out the ground" or in some other mysterious manner. The coils of generators are sometimes grounded by the effects of static electricity. Many power stations have installed in them generators which are driven by belts from the engine or prime mover. Certain atmospheric conditions will cause static electricity to be liberated from belts which may be traveling over pulleys at speed. This static charge can sometimes be seen between the belts and pulleys, or it may be drawn from the belt in a long spark if the finger of the hand be held near enough to the belt. A discharge path should be provided for these charges of static electricity. If such a discharge path is not provided the static electricity will find its way into the frame of the generator or its windings and may puncture the insulation of the wires forming the armature conductors. When such a puncture is made, no matter how small (and it generally is minute in size), it soon enlarges and the resistance at this point becomes sufficiently reduced to permit of the passage of the main current of the machine in sufficient quantity to cause damage. The result would then be a badly grounded coil on the armature. This defect may be noticed more readily on machines used for arc lighting because the voltage there used is high enough to break down the insulation quickly. In the case of all belt driven generators, no matter for what purpose they may be used, it is a wise precaution to provide means for carrying away static charges of electricity and prevent their seeking a path to ground through the machine which is being driven. Such precautions are simple, and, where it is desirable to avoid grounding the frame of the generator, an effective protection consists of a sort of a metallic comb which may be supported close to the under side of the belt so that the points of the comb are brought quite close to the belt without touching. This arrangement may then be connected to the ground by running a wire from it to a suitable ground connection. It will effectively carry off any static charges which may accumulate upon the belt. The metal comb may consist of nothing more than a bare piece of copper wire, with smaller pieces of wire twisted around it so that they will stand upright or toward the belt and at right angles to it.

The unequal strength of field poles might properly come under the head of a weak magnetic field. No one who reads this paper will probably ever have occasion to examine a generator with a view of ascertaining whether its field poles are of unequal strength or not, for the reason that such a condition is one of design and not the result of operation. Two-pole motors or generators have but one magnetic circuit and, therefore, each pole will carry the same number of magnetic lines of force. The distribution of these lines of force may differ owing to the different shapes of the field poles or in the variation in the homogeneity of the metal of which the poles are composed. This difference is not such, however, as to cause difficulty in operation. Machines of the multipolar type, machines which have more than one pair of field poles, will have more than one complete magnetic circuit (there is a complete magnetic circuit for each pair of magnet poles), and there may be one pole which will be carrying more lines of force than any of the others. In general, such an unbalanced field is not met with in street railway motors, but is not uncommon in generators or shunt- and compound-wound motors. Railway generators always have multiple-wound armatures, which means that the armatures have as many paths for the armature current as there are poles. Therefore, in order that an equal pressure shall be generated in corresponding portions of the armature circuits, there must be the same number of lines of force in the different magnetic circuits. If one magnetic circuit were weaker than the others, then a reverse current would flow through the coils when passing through that portion of the magnetic field. It is almost impossible to build large generators so that with the large mass of iron which the field poles comprise, a nearly equal distribution of the magnetic lines of force will be found all the way around. This constituted a serious difficulty in design for a considerable period of time. Generators of large size would spark heavily, would not carry full load continuously and gave much trouble in operation. A simple remedy was found, however, which consisted in employing cross connecting rings at the rear end of the armature and connecting these rings into equi-potential points of the armature winding. The result is a machine that operates perfectly under any condition of load, and no matter how unbalanced the magnetic field may be.

Vibration of a dynamo or a motor may cause sparking. Oftentimes such a vibration is due to an unbalanced armature, an unbalanced pulley, to a belt that is not laced or properly joined together, or some similar causes. When sparking is due to these causes a tightening of the brush-holder springs will relieve the condition or perhaps obviate it, but it is much better to attack the real cause of the trouble and not take the chances of damaging the commutator by increasing the brush friction.

Open circuits in the armature winding will cause the brushes to spark heavily when running, and if the generator or motor be operated on 500 volt circuits then the sparking might more properly be termed flashing. After an armature operates a short time under such conditions the commutator bar next to the open circuited coil will become blackened on its edge, due to the burning effect of the flashing. The flashing is the result of one commutator bar being dead (because it is connected to an armature coil that is open somewhere) and the current flashes from one live commutator segment to another as the brush moves over the gap. It is easy to distinguish this trouble from the flashing that is due to an aggravated case of a high commutator segment or eccentricity of the commutator, because in the last named cases the movement of the brushes will show how the commutator surface is, in addition to which a high segment will cause a noisy operating characteristic.

An open circuited armature coil is frequently found open where it is connected to the commutator segment. The remedy is to reconnect it. If the facilities are not at hand to do this properly, as by soldering, then the two adjacent commutator bars may be connected together (the dead bar and the one on either side of it). This connection can be made by connecting the two wires leading to the commutator together at a point where it will not interfere with the operation of the machine, by connecting a piece of wire across the two bars or by forcing a copper wedge between the adjacent commutator segments. These are only emergency repairs and such as can be made on the road to prevent delayed stops. The coil should be connected in the shops in a proper and permanent manner. If the armature coil is open somewhere within itself, i. e., not at the commutator segment, then the only thing to do is to put in a new coil except for the emergency repairs just noted.

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THE FIREMAN'S DUTIES AND COAL COMBUSTION—I

BY W. L. FRENCH

Question.—What is a fireman's first duty, in relation to his work, after being called for service?

Answer.—To arrive at the roundhouse and be on his engine in ample time to perform those duties required of him by the road on which he is employed, preparatory to making a trip. Quite often there is something that needs attention before commencing the trip, that is not done for the regular routine, and a delay requires explanations that are not always easily made. Better to have a few minutes spare time than to be hurried, or delayed.

Question.—In general what are a fireman's duties?

Answer.—On arrival at engine for

which he is called he should first note water level in the boiler, the condition of the firebox and flues and of the fire, the same as the engineer should do on his arrival. The grates should be moved gently to be certain they are free. If there are firebox or flue leaks, flues clinkered over or plugged, or the fire is in bad condition or grates stuck, he should call the engineer's attention to it, so that the roundhouse foreman may be notified and the defective condition remedied if possible.

He should note that the engine is equipped with the proper firing tools and flagging appliances, i. e., red light, fusees and torpedoes. He should try his injector and see that it is working properly, and if cold weather apply the heater to it. If at night he should light such lamps as are necessary. He should be particular to note the condition of the ashpan, the amount of coal on the tender and take water if needed.

Question.—In passing from the roundhouse to the train in the yard, what should a fireman do?

Answer.—He should ring bell if engine is not equipped with a bell ringer, watch for switches that might be wrong, and for signals on his side. He should observe that cars on all tracks clear the lead and watch for any moving engines or cars on his side.

On curves or obscure places he should be extra watchful. Remember that it is much easier to keep out of trouble than to get out, and a little extra caution will do no harm and may do much good. On arrival at train he should commence to get the fire in condition to start the trip. Of course the fire should not be allowed to become low leaving the roundhouse, but there is always time to put fire in shape on arriving at train before leaving, unless there has been some unusual delay on roundhouse track, in which case the fireman must be governed accordingly in preparing his fire for starting.

Question.—What is combustion's common term?

Answer.—Burning.

Question.—What is combustion as applied to coal burning in a locomotive?

Answer.—The union of the oxygen of the air with the carbon and hydrogen of the coal, forming a gas that ignites at a high temperature.

Question.—What is noticed in the front end or smokebox of a cold locomotive when a fire is first started in firebox?

Answer.—Water forming, commonly called sweating.

Question.—What is the cause of this?

Answer.—The first gas released from the coal is hydrogen gas. One atom of this gas uniting with one atom of oxygen gas makes water in vapor form, and this coming in contact with the cool tubes and sheets at the front of the boiler condenses it into water.

Question.—What are the elements of combustion in locomotive practice?

Answer.—Quality and composition of the fuel being burned, and the distribution and application of air through the fire to produce the most heat with the smallest possible fuel consumption.

Question.—What is perfect combustion?

Answer.—The supplying of just enough air and coal continuously to make the required number of heat units to furnish the amount of steam needed to do the work in hand without any fuel waste.

Perfect combustion, it is but fair to state, is only a theory and it is not likely that it will ever obtain in practice, owing to the irregular manner of supplying the fuel and changing conditions a locomotive is required to meet in actual service.

Question.—What is atmospheric pressure?

Answer.—The pressure exerted by the atmosphere on any object at the sea level. Fifteen pounds per square inch is the accepted standard in common use.

Question.—What does the steam gauge indicate?

Answer.—The steam pressure per square inch on the boiler above atmospheric pressure. The atmospheric pressure must always be considered when counting the effectiveness of steam pressure.

Question.—What is steam?

Answer.—An invisible gas generated from water by heat. That it is invisible may be noticed by observing a space between the visible vapor and the open cylinder cocks on a warm day, or the spout of a fiercely boiling teakettle. The space between the visible vapor and the vessel from which it is escaping is filled with steam that the cooler atmosphere has not yet vaporized.

Question.—At what temperature does the change from water to steam commence?

Answer.—At 212 degrees F. Where

water is being converted rapidly into steam, the temperature is of course much higher in the boiler, particularly in that part of it surrounding the fire. The temperature of a boiler carrying 145 pounds of steam is on an average, about 363 degrees F., of one carrying 175 pounds, 377 degrees F., and of 210 pounds, 392 degrees F. So that a high pressure per square inch carries with it a higher temperature also.

Question.—What is very necessary to secure proper combustion of coal?

Answer.—First of all a careful, observant fireman. No matter how good the condition of the engine or its appliances may be, or how high grade the fuel, they must be handled intelligently to secure good results, and to this end the engineer can co-operate greatly in the handling of the train.

The fireman must keep his fire as light as he possibly can, consistent with the work being done. In other words, he must not over-feed or under-feed the fire. He must also handle his dampers so as to muffle the draughts when necessary and avoid "popping," and open the door when necessary to clear up the black smoke. The door should be opened as little as possible, as the cold air entering passes not only over the fire but the tubes and side sheets as well, and causes sooner or later firebox leaks. He must not only study the engine, but the grades and stops for his particular train, so as to know where to ease off on his firing and avoid steam waste through the pops, which, according to tests made at Purdue University, amounts to about one-quarter of a pound of coal for each second a pop is open, or a loss of 15 pounds of coal per minute, a considerable loss when one thinks about it. In fuel saving the engineer and fireman must work together to secure the best results.

Question.—What is the largest expense a railroad has for any one supply?

Answer.—Fuel. So that a small saving by each engine, even, means a great saving in the aggregate in a year on a large number of locomotives.

Question.—Name some heat losses that cannot be entirely avoided.

Answer.—The losses by convection, conduction and radiation. Lagging is used to overcome these losses so far as possible.

Question.—What are some causes for other heat or fuel losses that could be avoided?

Answer.—Engine cylinders too large for the capacity of the boiler, or heating surface not great enough for size of boiler. Improper draught appliances or ones not properly adjusted, steam blows in valves, cylinders or steam pipes; also of valve rod or piston rod packing. These latter defects can only exist through failure to report them or failure to do the work if reported, and these conditions should not be allowed to exist longer than the engine can be got to where the work can be done.

Question.—Name some things that can be avoided in train handling that causes a fuel waste.

Answer.—Starting a heavy train out of town rapidly on a light fire. Trying to make up all the time when late in the first few miles. Running too fast from station to station and then waiting for time. Fast time requires more fuel than slow. Easing or shutting off to kill time to station after running too fast, and allowing pops to blow steam away. The filling of the boiler so full when leaving the roundhouse or approaching stations that there is no room left to put more water in the boiler to avoid steam blowing off. Use the blow-off cock to keep the water down, if necessary, in order to do this, and it also benefits the boiler.

Question.—How should a locomotive be worked?

Answer.—So as to haul the train and make the time as easily as possible.

Question.—What ought an engineer not do?

Answer.—Pull out until he knows the fire is in proper condition. It may cause a delay of a few moments but it can be made up after starting and the fire will not be spoiled by crowding. This is true even when going on a time order. The lever should be left in the corner only long enough to start the train and then pulled up to half stroke, if possible, and on the large engines this can always be done and the train speeded up as fast as it could be. The point of cut-off should always be as short as is consistent with the good working of the engine, speed to be made according to weight of train being pulled. This may mean a short cut-off and a heavy throttle, or a longer cut-off and lighter throttle, as occasion demands. The engineer alone can be the judge as to which will give the best result on the type of engine he is running.

Question.—Should the fireman always note the water level and consider it in respect to his firing?

Answer.—Yes. If water level is low the fire must be kept up to maintain the water level and secure a higher one when opportunity affords.

Question.—Should a locomotive on a local freight be pumped the same as on a through freight?

Answer.—No. On a local water can be lost to a certain extent between towns and regained while doing work about the station, but on a through run the supply must be kept equal to the demand. Leaving town the injector should be shut off and the fire allowed to be got in shape to meet the demand on the steam supply before injector is started. Air leaks in the train line and careless handling of steam heat pipes on passenger trains are also a source of fuel waste.

Question.—What are the component parts of soft coal?

Answer.—Eighty per cent. carbon, 5 per cent. hydrogen and 15 per cent. waste material. This is a general average for different kinds of soft coal. One kind might have more carbon or more waste material than another. A railroad company might find it more advantageous to use a coal with a rather low per cent. of carbon that was on their line than to bring a coal that would run higher in carbon from a distance on account of the cost of transportation.

Question.—What are the two most important elements of combustion?

Answer.—The carbon of the coal and the oxygen of the air.

Question.—What is carbon?

Answer.—It is one of the elements of coal created by a process of nature when the coal was forming.

Question.—What per cent. of the air is oxygen?

Answer.—About 20 per cent. or one-fifth of the air's volume.

Question.—Is combustion possible without air?

Answer.—It is not. Oxygen is absolutely necessary to combustion, and the oxygen of the air must come in contact with the carbon of the fuel to cause combustion.

Question.—How much air is necessary for the burning of a pound of soft coal?

Answer.—From 12 to 18 pounds, or from 160 to 260 cubic feet of air, a pound of air equaling approximately 13 cubic feet of air. The air consumption for a ton of coal is therefore enormous and illustrates the need of free air admission to the fire where combustion is as rapid as it is in locomotive practice.

Question.—How can the elements of soft coal be determined?

Answer.—By chemical analysis only.

Question.—Which is the lighter, gas, carbon or hydrogen?

Answer.—Hydrogen. In the process of combustion it is first thrown off and a certain amount of moisture with it. The carbon is next given off and burned, but the two processes are so united as to be practically one. Nothing is lost during the process of combustion, only a change of form taking place.

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SELLERS' NON-LIFTING 1908 INJECTOR

BY C. B. CONGER

Non-lifting injectors were designed and put into service a number of years ago and they proved both economical as to first cost and repairs, also as to their steam consumption. While the lifting injector was the first one invented, yet the non-lifters at that time made such decided gains in economy that many of them were designed and adopted. So well did they do their work that there are numbers of them still in service on the smaller locomotives that are so efficient they have not been replaced with others of later design of the lifting type.

All non-lifters are located below the water line of the tender so the feed water will always flow to them by gravity, thus they do not require the priming or lifting device necessary with all lifting injectors.

But as the duties of the engineer and fireman became more numerous and more exacting the non-lifters were gradually supplanted by lifting injectors, until today lifting injectors are favored because of their greater convenience over the old type of non-lifters.

To operate a non-lifter of the old type, unless you had handled it enough so you could tell by the sound when it was working properly, it was necessary to open the lazy-cock or the overflow valve, sometimes both the cocks, allow the water to flow through the injector and out of the overflow, look down to see that the full stream of water was running from the overflow or waste pipe, then turn on the steam gradually until the injector was primed, and, lastly, open the steam valve until the jet was formed through the tubes, and the supply of water going into the injector was all passing into the boiler and none coming out of the waste pipe. This took the engineer's attention away from the track and signals, where it was needed every minute he was under way. A fancied improvement was made when the overflow pipe and its heater valve was brought up from the injector body into the cab, above the level of the water in the tender, and a priming steam valve located at the injector body, but this type, which was really a lifting injector set below the water level, did not appeal to the engineer as any more convenient than a lifting injector set ahead of him in the cab and exactly in the range of his vision, when running the engine.

The greatest disadvantage with the old non-lifter was that it was not an automatic or restarting injector, that when the injector refused to work and the jet broke the steam went back into the tender as well as out of the waste pipe, and the steam valve to the injector must at once be shut to prevent heating the feed water too much; it then had to be started all over again to get it feeding the boiler. This took the engineer's attention from his other duties as well as shutting off the supply to the boiler until the injector was operating again.

Another disadvantage with the old non-lifter was that the overflow valve and lazy-cock must be opened before the injector was started, and one of these valves closed when the injector was shut off, to prevent the waste of water.

Some of the advantages of a non-lifter are: It is simpler to operate, contains fewer parts and is less affected by lime and scale in the water supply. As it does not have to lift the water, the most delicate part of an injector, the lifting jet and its valves, can be left off; thus the original cost and that of maintenance are much less than with the lifting injector. Priming an injector readily is usually the test of its convenience and efficiency. If you can get it to prime, it will usually force. A non-lifter is *always* primed if there is any water in tender.

A restarting injector, when the supply of water is cut off, will allow all the steam to pass through the tubes and out of the waste pipe, none going back into the tank, so that as soon as the supply of feed water to the injector is resumed the injector goes to work again with no waste except the steam that has passed out of the overflow. This is the case when the feed water becomes low in the tender and slops backwards and forwards when switching or starting the train. In case the boiler is foaming and water or spray come over with the steam, the jet will break for an instant and steam and water will splash out of the overflow, then form again when dry steam comes down to the injector. Of course all restarting injectors have an automatic or open overflow valve, as with a closed overflow valve there would be no way for the steam and air to escape when restarting.

Wm. Sellers & Co., Incorporated, of Philadelphia, the pioneer manufacturers of injectors of the United States, have recently brought out and placed on the market a new type of non-lifting injector, that in addition to being restarting and self-adjusting has a new feature, an automatic water valve in the body of the injector that closes automatically when steam is shut off. This prevents the flow of feed water to and out of the waste pipe when the injector is not in operation, so there is no danger of wasting any feed water if the lazy-cock or waste valve is not promptly closed when the injector is not in operation. When steam is turned on this water valve is opened at once by the steam pressure and the feed water flows to the injector so it goes into operation. This obviates the necessity of watching the waste pipe on the part of the engine man. All he has to do is to open the steam valve the proper distance and regulate the steam and water supply when the injector is operated.

The advantages of a lazy-cock built in the body of the injector are decidedly above those of a separate lazy-cock located in the suction pipe, usually being the tender valve. It is more easily operated and does away with any leaks of air into the injector in case the couplings between the lazy-cock and the injector work loose. Lifting injectors are most successful when the water supply can be regulated at the injector, and non-lifters are no exception to this rule. A globe valve is much more effective in graduating the supply than is the plug valve made by most of the locomotive builders.

The steam and water tubes are so designed that the amount of water delivered to the boiler increases or decreases with a corresponding change in steam pressures, providing the lazy-cock is open wide enough for the maximum amount without wasting at the overflow. This is called "self-adjusting," that is, requiring no regulation at the lazy-cock to prevent waste at the overflow when the steam pressure falls.

A non-lifting injector can be worked much more economically than a lifting injector if it has a screw-stem steam valve. With this valve the supply of steam can be regulated so no more steam passes to the injector than is necessary to pick up the water at the overflow. This point is not sufficiently appreciated by all the men operating non-lifters, but if followed out will soon prove to use less coal, make a better steamer and give a longer life to the injector tubes. A lever valve can be used with this injector the same as with a lifting injector, as it is more convenient but not as economical of steam, because the lever valve is usually opened wide regardless of the amount of steam necessary to form the jet through the injector tubes.

Fig. 1 is a sectional view of this injector. At the lower left-hand corner is shown the overflow or waste valve complete, which is to be screwed into the body of the injector at the circular opening seen behind the combining tube *2*. To make the injector either right or left-handed there are two of these circular threaded openings, one on each side of the injector body, the one not used for the waste valve being closed by the cap nut *96*.

The steam nozzle *3*, is made in two parts, the annular nozzle for priming and restarting being around and outside of the forcing or main steam nozzle. The combining tube *2*, is made in three sections, the upper section being the draft tube, the middle section (seen at *2*) the combining tube, and the lower part is the forcing tube. The delivery tube *87*, is shown in section only part way down, which gives an idea of its internal shape and also the lower end where a wrench can be applied to remove the tubes. This complete set of tubes is screwed into the injector body just above the point indicated by the figures *87*, while the top end of the draft section is a neat fit in the body. To make it water and steam tight, a small groove around it is filled with asbestos cord. In the bottom cap, *89 A*, is the check valve, *20 K*, which when raised comes up against the end of the delivery tube *87*. When the injector is not operating this prevents the escape of water from the delivery pipe *23 A*.

The injector body is indicated by the reference figures *230*; the gravity inlet valve *231*; the inlet valve cap *232*; the bonnet or threaded nut *233* for the lazy-cock stem *234*; this stem, *234*, has a quick thread screw so that a little less than one-half a complete turn will give a full movement to the lazy-cock either open or shut. A spring, *235*, is inside the stem *234*; this spring, which is of light tension, assists in closing the automatic water valve *236*. Steam piston *237* is used to open valve *236* when steam is turned into the injector at the valve up in the cab. The steam comes down the cored passage from steam pipe *19 C* into the cap nut *238* and builds up a pressure there that lifts piston *237* and valve *236* against the tension of spring *235*, raising this valve which opens the passage for water to the tube *2*.

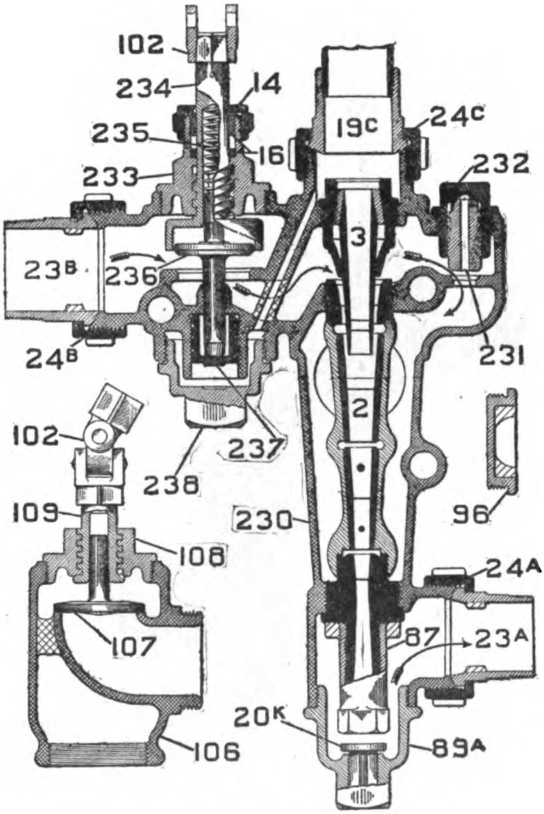

Fig. 1. Self-Acting Injector, Improved N.-L. of "1908"—Sectional View

With the lazy-cock open and the injector not working, the head of water from the tender fills the suction pipe *23 B* and presses against the automatic water valve *236*, holding it down on its seat, thus preventing any flow of water past valve *236* to the tubes and waste valve, which should be open, except when using it as a heater. With the overflow valve shut and steam turned into the injector to use it as a heater, the steam will back up through the tubes, raise valve *236* without any difficulty and pass into the tender.

To start the injector admit steam to the pipe *19 C*. From this pipe it passes not only into the nozzle *2*, but also through the cored passage from *19 C* into cap nut *238*, pushes up piston *237* and automatic valve *236* into the position shown in Fig. 1. Water then flows to the body of the injector, around steam nozzle *3*, and over the upper end of the draft section above the combining tube *2*. The water first comes in contact with the jet of steam from the short annular nozzle that is outside and around the long main steam nozzle, and is forced through the draft section of the combining tube which gives it the first, or preliminary, impulse. We might say, right here, that this action of the annular steam jet and water supply is what makes the restarting feature. The stream of water as it passes through the draft section of the combining tube is in a thin sheet around the main steam jet tube. When it reaches the end of the main steam nozzle it is caught by the forcing jet and, being in the best possible shape for this jet to act on it, that is, enveloping the steam jet, it absorbs the velocity or power of the forcing steam jet and the combined jet of steam and water passes at an increasing speed through the steadily contracting area of the combining and forcing sections of the tube until its velocity is so high that it will cross the opening between the combining and delivery tubes and pass into and through the delivery tube with a greater velocity than water under pressure of the boiler could have if coming the other way through the delivery tube. If the boiler pressure is 180 pounds, the velocity of a jet of water coming from the boiler is about 164 feet per second. But the velocity of the jet of combined steam and water when it issues from the combining tube and passes into the delivery tube is 198 feet per second. You can readily understand that the jet with 198 feet travel per second must have more force than one with 164 feet, and will not only pass into the boiler against the 180 pounds pressure but will have some force to lift the check valves; in fact, it will work against a delivery pipe pressure of 206 pounds.

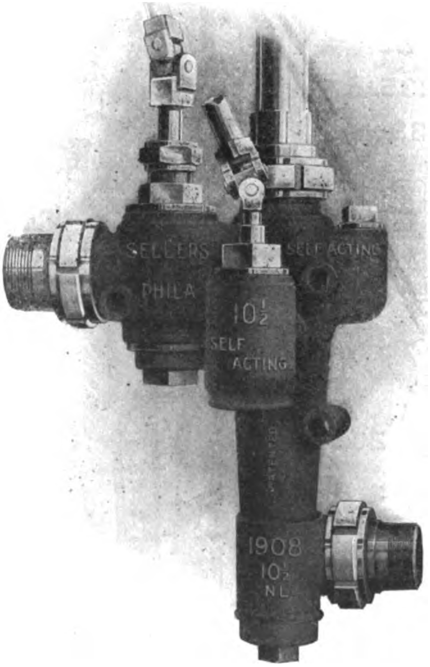

Fig. 2. Self-Acting Injector, Improved N.-L. of "1908," with attached Automatic Lazy Cock

With this type of injector, if the steam valve is opened quickly the operation of starting gives only a small spurt of water from the overflow, and when stopping the injector there is very little waste of water from it.

When you examine into the waste of water from the ordinary injector when starting and stopping it, and the icy condition of platforms and yards from this amount of water in cold weather, you can readily believe that a device to prevent this waste of water is both economical and safe.

This deals with the injector when working with a maximum water supply. When the water supply is cut down to the minimum (by partially closing the lazy-cock) that a full supply of steam will work without sputtering hot water and steam out at the junction of the combining tube *2* and delivery tube *87*, and thence at the waste pipe, experiments have shown that the jet as it leaves the combining tube and enters the delivery tube has a velocity of about 600 feet per second, and the large amount of steam used has raised the temperature to 235 degrees. The density of the combined jet is now about .2 instead of unity, and this density shows that the uncondensed steam is passing through with the water in the combined jet.

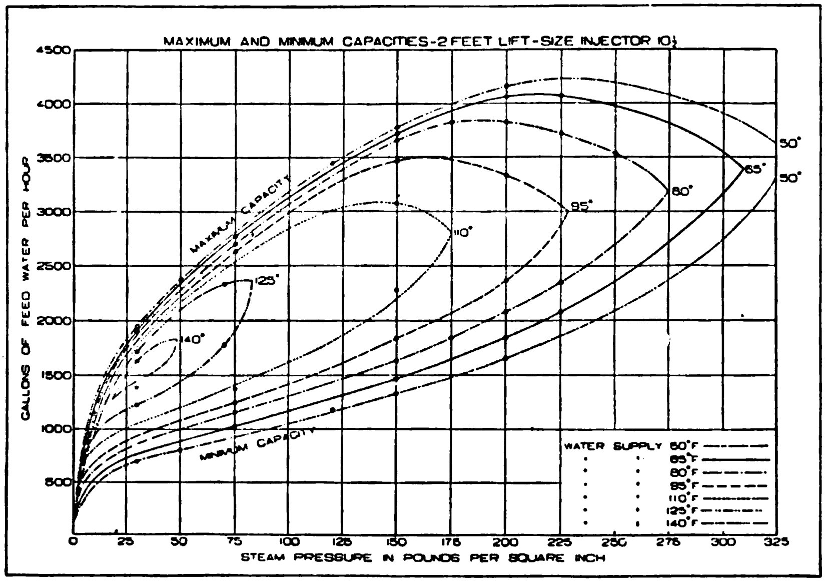

Diagram A.

The diagram shows the maximum and minimum capacities at steam pressures ranging from 2 pounds per square inch to 325 pounds, when the temperature of the water supply is 50, 65, 80, 95, 110, 125 and 140 degrees, the Injector in each case operating with the overflow valve free to open, to permit automatic restarting. The vertical scale indicates gallons per hour from 0 to 4,500, and the horizontal scale steam pressures from 0 to 325 pounds.

From the diagram can also be obtained the range of capacities for any desired steam pressure and water supply temperatures by subtracting the values given by the curved lines. For example, when the boiler pressure is 200 pounds and the water supply 65 degrees the maximum capacity is 4,068 gallons per hour and the minimum 1,846, giving a range of 2,222 gallons. The overflowing temperature is that point at which no regulation of the water supply will prevent the emission of drops of water at the overflow. It therefore corresponds to the temperature at which the maximum and the minimum capacities coincide. This is indicated by the pointed junction of the maximum and minimum lines on the diagram for any given condition. For example, at 275 pounds boiler pressure the overflowing temperature is 80 degrees; at 175 pounds, 110 degrees; points not shown on diagram may be interpolated.

The results shown on diagram are of much interest and show remarkably high capacities at steam pressures varying from175 to 250 pounds. The upward course of the line of maximum capacities corresponds closely to the theoretical line for perfect efficiency. The tests were made with a single set of tubes for all pressures, operating as low as 2 pounds steam and tested as high as 250 pounds, the extension of the capacity lines showing the performance at still higher pressures.

Now as to the action of the inlet valve *231*. When an injector is working with a full supply of steam, say above 150 pounds, a vacuum is formed in the overflow chamber or body of the injector around the combining tube. If under these conditions an additional supply of feed water is admitted to this overflow chamber it will be drawn into the openings in the combining tube. This tends to increase the capacity of the injector with high steam pressures about 20 per cent.; that is, about 20 per cent. as much more water as is passing through the draft section will flow through the inlet valve *231* when there is a proper vacuum in the overflow chamber. To reduce this to figures, if 1,000 gallons of feed water flow into the upper end of the draft section in a certain number of minutes, 200 gallons more will flow into the overflow chamber past the inlet valve, or 1,200 gallons in all will pass through the delivery tube and with the same steam consumption that handled only 1,000 gallons through the draft tube. This, of course, makes an injector with an inlet valve in operation more economical in the use of steam than one without any inlet valve.

The operation of this inlet valve is as follows: The valve in construction is like a differential piston with the large end in the cap nut *232* and the small end covering the water opening below it. An opening through the valve makes a direct connection between the overflow chamber and cap nut *232*, as we have in the overflow chamber. When there is no vacuum in the overflow chamber the weight of the valve is sufficient to keep it seated against the pressure of the water from a full tender. When the injector is operating and the vacuum in the overflow chamber rises to the proper point, indicating a deficient water sup-

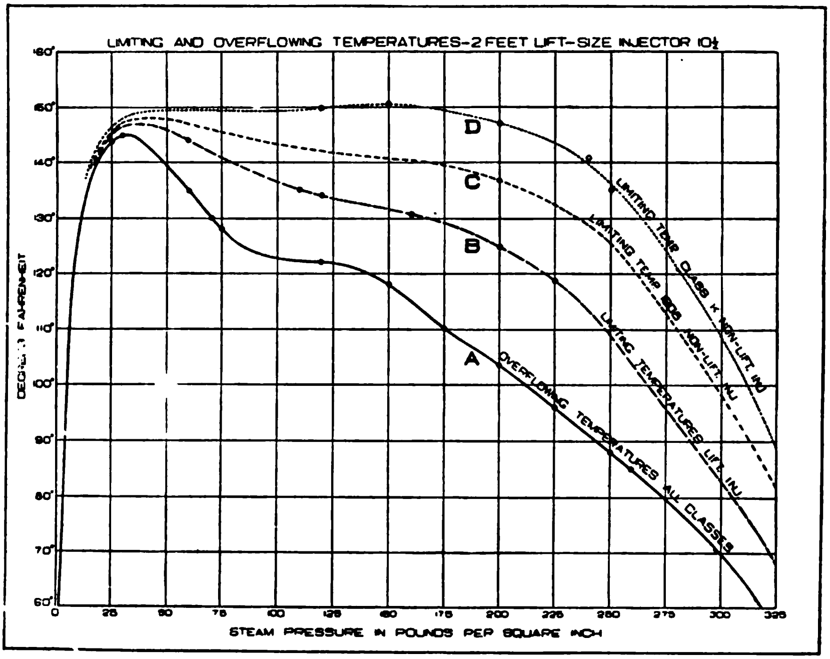

Diagram B.

The diagram shows the limiting temperature of the water supply of the several classes.

The lowest line, "A", records the overflowing or maximum restarting temperature of all classes.

The dotted line, "B," the highest temperature of water with which the *lifting* Injectors can operate.

The line, "C," the highest admissible temperature of the water supply of the 1908 non-lifting Injector, equipped with Automatic Lazy Cock.

The line, "D," the highest operating temperature of our well-known Class K Non-Lifting Injector.

The above diagram is based upon tests of the No. 10½ Injector, and applies equally to all of the larger sizes.

The appended table gives the limiting temperatures with 150, 180 and 200 pounds steam pressure.

	150 lbs.	180 lbs.	200 lbs.
Overflowing Temperature, all classes	118°	109°	104°
Highest Operating Temperature, Classes N, M, P	132°	128°	125°
Highest Operating Temperature, Non-Lifting 1908	140°	139°	137°
Highest Operating Temperature, Class K, Non-Lifting	151°	148°	147°

ply, a similar vacuum is formed above the valve through the hole in its center; the water pressure then lifts it, and a steady supply of water flows into the overflow chamber and then into the combining tube opening, and the delivery is correspondingly increased. This valve does not interfere with the action of the injector with low pressure of steam, as it then remains closed. It also remains closed when the injector is priming or restarting, so that steam from the spill openings in the tube does not get back into the suction pipe.

There is another advantage in this flow of water into the overflow chamber. The cold feed water around the combining tube prevents in a measure the rapid formation of scale, not only in the spill opening of the tube, but inside of the combining tube itself.

A restarting injector has large spills or overflow openings in the combining tube to take care of all the steam nozzles and all the air that draws in at the suction until such time as the supply of water reaches the tubes. The overflow pipe must also be large enough for this purpose. You will note that all restarting injectors have the overflow pipe larger than the steam or suction pipe. Without this feature the injector will not restart promptly. The annular jet of steam passing through the draft tube keeps up a steady draft from the suction pipe, and the steam and air can pass out into the overflow chamber through the large spill opening between the draft section and the middle section of the combining tube. This annular jet also prevents any steam from the main jet passing back through the draft tube and into the suction; it must pass out through the spill openings into the overflow chamber. Therefore as soon as water comes to the draft tube in a proper amount it is forced past the large spill opening, so the forcing jet takes it in charge and hurries it along to the boiler.

There are many advantages in a restarting non-lifting injector, as the engineer does not have to watch it so closely to keep it in operation. Turn on the steam and it goes right to work, as long as it gets a proper supply of steam and water. It will give one a loud notice at the overflow pipe when it quits forcing water, and the steam will not go back into the tank and heat the feed water when it breaks. It will handle hotter feed water than most of the lifting injectors. It can be located below and out of the cab where the splash of hot water and steam when it is being started or stopped, or when it sputters at the overflow, will not confuse the engineer as an injector located close to his face may do. With the narrow space in the cabs on the "battle-ships" of the present day, there is no room for the large injectors needed, and they are better off below the cab than ahead of it along side the boiler. A type of injector that is more reliable than another about priming and starting, and more certain to work under adverse conditions, is one that will eventually supersede other types.

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MOVEMENT OF TRAINS

BY G. E. COLLINGWOOD

Train Rule Talks.

On account of the pressure of other business arrangements Mr. Dalby, who has edited the Train Rule Department of this Magazine for several years past, finds that he is unable to continue the work, and I am asked to put my shoulder to the wheel and continue the uplift for a clearer understanding of train rules and if possible a more uniform interpretation. In answering questions through the columns of this journal I shall, whenever possible, give the authorized interpretation of the rule or order under discussion; when no authorized interpretation of a rule has been made, the interpretation will be such as to work safely.

I wish to specially impress upon my readers that they must not depart from the rules or rulings of the road upon which they are employed because of any statements I make here concerning the proper interpretation of rules or orders.

for the reason that any railroad is at liberty to make any interpretation of Standard rules which they may see fit, whether such interpretation is in accordance with the rulings of the American Railway Association or not. There are, however, a great many points upon which many railroads have never made a ruling and upon which trainmen hold different views; it is these rules and orders which I shall talk most about in the space allotted to me.

One of the most important things to remember in connection with train orders is that train orders once in effect continue so until fulfilled, superseded or annulled.

To fulfill an order a train must carry out its provisions so far as they relate to that particular train; for example, you hold an order to meet No. 1 at B; you must actually "meet" No. 1 at B before the order is fulfilled, or if you hold an order that No. 1 will run thirty minutes late the order is fulfilled when No. 1 is thirty minutes late at the point where you are, or if you hold orders to work 7 a. m. until 6 p. m the order is not fulfilled until 6 p. m., etc.

An order or part of an order is superseded by adding to the prescribed forms the words "instead of ...." There is no other way to supersede an order, and when this is done only such part of the order is superseded as the words "instead of" refer to. For example, order No. 1 is issued reading, "No. 1 meet No. 2 at C and No. 4 at D." This is followed by an order reading, "No. 1 meet No, 2 at B instead of C." In this case the only portion of order No. 1 which is superseded is the meeting point at C; the meeting point of No. 1 and No. 4 at D still holds good. Remember that never under any circumstances is an order or part of an order superseded unless the words "instead of" are used in a subsequent order, and then only such portion of the order is superseded as the words following "instead of" refer to.

To annul an order or part of an order a subsequent order must be issued reading, "Order No. .... is annulled;" or, "That part of order No. .... reading .... is annulled."

Orders held by or issued for or any part of an order relating to a regular train become void when such train loses both right and schedule as prescribed by rules 4 and 82, or is annulled.

The above methods of disposing of a train order which has once been in effect are the only methods of which the book of rules tells us anything; but there is one more condition under which train orders become void, and that is when a train reaches its terminal.

The Standard Code takes it for granted that when a train reaches its terminal that any orders they hold are dead, because train orders are issued for a train, and when a train ceases to exist it naturally follows that the orders cease to exist as such. But the framers of the Standard Code overlooked one thing in rule 220, and that was to provide for the voiding of the orders of an extra train when they reach their terminal. They probably thought, that is, if it occurred to them at all, that the orders would be void without special instructions to that effect, and those of us who make a study of train rules understand that they are void when an extra reaches its terminal; but I think that inasmuch as this question is continually coming up with trainmen, and in some cases even with train dispatchers, that it would be well to add to rule 220 the substance of the correct practice, to wit, "That orders held by or any part of an order held by another train relating to an extra train become void when the existence of such train expires by limitation of time or place."

Such an addition to the rule would not change the present practice, but it would help to give trainmen a better understanding of the situation and unify practice.

I have explained in detail the different methods of making a train order of no effect for the reason that more trouble occurs over train orders from failure to fully understand when train orders are in effect or are not in effect than from any other cause. Many wrecks have been traced directly to this cause, so that it stands all of us in hand who have to do with train orders to fully understand just when and how they become of no effect, for life and property depend upon a uniform and correct understanding of train rule subjects.

Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

739. Irregular Feed of Lubricator.—"Has the choke plug in a lubricator got all to do with the size of drop and how fast or slow it will feed?

"An old engineer and also a young fellow told me it did and I said it did not. I have noticed during my experience that when the choke plug was stopped up the lubricator kept feeding just the same, but when we had it examined on account of the valve and cylinder running dry it was found to be cross feeding, the equalizing tube filled up with water and the oil I supposed went to the top and down the other tubes. When I took the examination I was told and showed the same thing; when I told them they said I did not know, so I thought I would try and find out."—*M. G.*

Answer.—No, it has not, but in five cases in six is the seat of the trouble. As a rule, irregularity of feed is due to enlarged openings of choke plugs, or choke plug loose in its seat; this would cause the lubricator to feed faster when engine is drifting than when working steam. A restriction of steam supply to lubricator would have the same effect, that is, if the steam valve is not fully opened, if the steam pipe is too small, or equalizing tubes or passages clogged with scale, waste or part of gaskets; it is seldom, however, that these pipes or passages are found clogged. The case mentioned by our correspondent might happen, although it is very infrequent. If the choke plug became clogged solid so no steam could pass through, and this lubricator was in such position as to be exposed to a strong draft through an open window, for instance, so that condensation is rapid, the steam could condense in the passages and gradually fill these, and so on until the equalizing pipe connected to that passage became entirely filled with water; the oil issuing from the regulating valve would then feed up (due to being lighter than the water) through the glass into the steam passage and so on up and through the equalizing tube until it issued from the top; from there it would flow into the condensing chamber, and if this chamber were full of water to the top of the equalizing tubes it would naturally be carried over into the other or open tube by the flow of steam through it.

740. Screeching Noise of Injector.—"What causes an injector to make a screeching noise when it is in operation?"—*M. G.*

Answer.—Usually caused by vibration, due to the rapid flow of steam and water through the tubes; sometimes caused by the rotative movement of the line check at the end of the injector.

741. Increase of Lead.—"Will you please explain in the B. of L. F. and E. Magazine why the lead is increased as the reverse lever is moved toward the center of the quadrant? This, of course, is with the Stephenson link motion."—*R. W. L.*

Answer.—Increase of lead was explained in our last issue. However, we could go a little further and say that as the go-ahead blade is coupled to the top of the link and the back-up blade to the bottom of the link, and as the other ends of the blades are coupled to the eccentric straps and do not swing from a common center, hooking up, that is, bringing the reverse lever toward center of the quadrant, has the effect of increasing the angularity of the go-ahead blade and decreasing that of the back-up blade. In other words, the effect on the blade is the same as though the go-ahead blade were shortened and the back-up blade were lengthened. These changes have a tendency to throw the lower end of the rocker arm ahead, and consequently throw the upper end of the rocker arm back, by that means pulling the valve back and increasing the lead. Owing to the position of the eccentric when the engine is on forward center, if the reverse lever is hooked up the forward movement imparted to the link by the back-up blade is greater than the backward movement imparted by the go-ahead blade; consequently the lower end of the rocker is moved ahead the difference between the two, thus pulling the valve back and increasing the lead. When the engine is in back gear moving the lever toward the center causes exactly the contrary movement, and this increases the lead in the back gear the same as it was before increased in the forward gear.

In case this explanation is not clear, will furnish sketches if desired.

742. Center Line of Motion.—"All of the books I have teach that a line drawn through the center of the cylinder and the center of the crosshead will pass over the center of the driving axles. Now, with the engines here (C. M. & St. P. Ry.) the center of the axle is from one to two inches below this line. Why are they made thus? and are all locomotives made that way?"—*R. W. L.*

Answer.—A line drawn through the center of the cylinders should intersect the center of the main axle when the driving box is midway between the upper and lower rails of the frame, and all engines are built with this end in view. Of course a variation is possible, owing to the fact that driving boxes have from 3 to 6 inches of up and down movement in the pedestal jaws. On engines you refer to, it is possible that when engines were turned out of shop they were fitted with stiff springs, so as to raise the center of the cylinders above the center of the axles. This allows for settling of the springs and after a few weeks' service the center lines will coincide. On the older type of engines, where the cylinders were located higher than is at present practiced, it was found necessary to give the cylinders a slight inclination so as to bring the center line of the cylinders in line with the center of the main axle. I do not think this is the case in the engines you refer to, however, but believe that the former explanation. viz., that the engines were just fitted up with stiff springs, is correct.

743. Height and Position of Draft Pipe.—"In the report of the Master Mechanics' Association in the year of 1906, there was a report made on locomotive front ends, and on pages 255 and 256 of the proceedings of this convention you will find cuts describing the different locations of the convey, or draft pipe; however, it only gives the distance between the exhaust pipe and the convey pipe, also the distance from the exhaust pipe and the bottom of the sleeve. Why wasn't the distance between the base of the stack and top of the sleeve given, or can you give me this information?

"We have an Atlantic type engine which we have been unable to make steam. Engine has always been a free steamer; engine was out of shop some time ago and she steamed well for two trips and then fell down for steam entirely. We have tried the convey pipe and diaphragm in all positions and at present have the convey pipe one inch above the nozzle, one inch between pipe and sleeve, four inches between sleeve and base of stack, diaphragm 22 inches high, 5⅝-inch nozzle with bridge. Engine has 20 by 26-inch cylinders, stack 18 inches by 30 inches high. We have tested steam and exhaust pipes with 80 pounds cold water pressure; front end is not getting air; there is no mud in boiler. The stack and exhaust pipe are in line when engine is level; fires are clean; grate bars are open and clean; engine has a 75-inch extension front end. If you can give me any information on this condition of affairs I will be under many obligations to you."—*C. D.*

Answer.—You will find relative positions of the draft pipes, in regard to the height, position of nozzle, distance between the pipes and the distance below the arch, on pages 295, 296 and 297 of the 1906 Proceedings of the American Railway Master Mechanics' Association. You will note that on pages referred to it gives the series number of the tests the same as shown in the upper left-hand corner of diagram on page 255. As the length of each draft pipe was 18 inches you can easily from the data furnished calculate the distance the pipes were apart and the distance they were set between each other and below the smoke arch. By referring to the diagrams on page 255 you will note what combination of pipes, stack and setting gave the best results. This, as you will notice, is the combination shown in series 77, where the value of H was 24 inches. In regard to the particular case which you have in mind, it is a hard matter to state exactly what could have gone wrong with this engine. The fact that the engine steamed freely for two trips and then failed without apparent cause indicates that something must have gone radically wrong, and would lead one to believe the trouble was due to a leak, either in the steam pipe connections or under the nozzle stand. However, as you state these had been tested and found o. k., we must look elsewhere for the trouble. It is quite evident that the draft or convey pipes would not move up; for this reason we must assume that they slipped down, and therefore the adjustment would naturally be upward. I am inclined to believe that the way pipe is set at present causes too much of a restriction in the draft, and would be in favor of increasing the distance between the top of the pipe and the base of stack to 6 inches. You will note that the extension front is 15 inches longer than the best practice recommended by the Master Mechanics' Association, but as the engine did steam with this length of front end it is not reasonable to suppose that the trouble lies there. The diaphragm plate appears to me to be higher than necessary. Of course we understand that the principle use of the diaphragm plate is to act as a self-cleaner, and at the same time in a measure regulate the draft on the different portions of the firebox. Lowering the diaphragm plate would necessarily increase the action of the draft next to the flue sheet, while raising it would increase the draft next to the door. Even in this, however, the same judgment must be used, as when the plate is raised too high the front end will have a tendency to fill up with cinders.

We regret that we cannot, from this distance, diagnose the case carefully and suggest a remedy.

744. Irregular Release and Compression with Walschaert Valve Gear.—"We have in service on this road an engine equipped with the Walschaert valve gear, Brooks build, 18 x 26. The valves on the right side, forward motion, are set 5-32-inch, and on the left side, forward motion, 5-32-inch; and on the left side, back, 7-32-inch, and on the right side, back, 7-32-inch, being the same in a 25 per cent. cut-off, maximum port opening 3-16-inch. When this engine is working in the full stroke the steam will follow the piston within 1 inch of the end of the stroke and then release to the exhaust. When the reverse lever is in the running notch the steam will follow the piston 5⅝ inches in the back end of the left cylinder and 4¾ inches in the front end, while on the right side it will cut off in front end at 5⅜ inches, and in back end at 5⅝ inches; steam will then expand in the cylinders until the piston travels within 9 inches of the end of the stroke, when the steam is admitted to the exhaust and closes the steam port for compression. What I should like to know is, what changes would we have to make to overcome this large amount of compression and this early release. I have one of your books but have been unable to get this information from same."—*J. B. W.*

Answer.—The above question was referred to Mr. W. W. Wood, but owing to the lack of time to answer same, Mr. Wood referred it to these columns. Answering the above question would state that in the first place the lead could be equalized, as we know of no good reason why there should be a difference of lead in the forward and back motions. As the indications are that the valve stems are too long, these should be shortened, so the lead would be equalized. This would then give the engine 6-32 or 3-16-inch lead all around, which could not be said to be excessive for a mid-gear lead. Of course, it is understood that on Walschaert geared engines the valves are given mid-gear lead instead of full-gear lead, as with the Stephenson motion, owing to the fact that with the Walschaert geared engines the lead does not increase as the reverse lever is hooked up. On engines referred to by our correspondent, the fact that the cut-off is unequal, even with equal lead on both sides of the engine (we refer to the fact that both sides show the same lead forward and the same lead back), would indicate the further distortion of the valve gear, which could not be located with the limited data furnished. The difference in cut-off between the two cylinders ⅜-inch, or 3-16-inch on the end, is not serious, however, and may be due to wear. Equalizing the cut-off as above will increase the lead in the forward gear and consequently hasten all other valve events. Therefore in order to reduce the compression and overcome the early release two methods could be employed, viz,: decrease the lead by increasing the steam lap of the valve, or increase the exhaust lap and leave the lead as it will be after being equalized, viz., 3-16-inch. Either of these changes, however, might materially affect the working of the engine at short cut-off and high speed. The only proper way to find out what changes are necessary would be to use an indicator, or else plot the valve events with a Zenner diagram. The data furnished by our correspondent is not sufficient to enable us to lay out the valve events, as above.

745. Ganz Motor Car.—"Numerous railway official magazines have chronicled the purchase by the Rock Island, Florida East Coast and other lines of the Ganz steam motor cars. Outside of the barest outlines of dimensions very little detailed information is obtainable. The engines are high speed (900 R. P. M.) cross-compound and steam jacketed, and use superheated steam of 650° F. initial temperature. How is the scheme of steam jacketing carried out? Is the jacket the main channel to the high pressure valve chamber, or simply an auxiliary line? Is throttling done before or after leaving the jacket? Are both cylinders jacketed or just one, the H. P. and receiver?"—*W. R. H.*

Answer.—Ganz cars are used rather extensively in Central Europe in three sizes, 35, 50 and 80 h. p. at 260 r. p. m. The general arrangement is the same in all three, the boiler being placed in a compartment at the forward end of the car, together with fuel bunker, feed pumps and controlling apparatus. The motor is placed horizontally on the leading truck, and drives the rear axle through spur gears. It is supported in the usual electric railway motor style, one end being swiveled above the axle, and the other supported elastically from the truck frame. The car is controlled from one end, and one man is required to operate it. The boiler consists of four concentric cylinders with headers (held in place by bolts) forming two annular water spaces joined together by means of slightly inclined steel water tubes, 25 mm. outside diameter and 2 mm. thick. Within the inner circle is another cylinder of slightly smaller diameter through which the fuel is fed to the grate below, the flame and hot gases passing around the water tubes to the stack. The motors are two-cylinder cross-compound. The largest car, 80 h. p., weighs 23 tons, and is capable of climbing a 1.6 per cent. grade, with two trailers weighing 12 tons each, at a speed of twenty-five miles per hour. This type of car, however, is now being modified or redesigned, increasing the power to 200 h. p. and radically changing the type of boiler construction heretofore employed, owing to the necessity for greater power. The two-cylinder compound motor will be eliminated and in its place will be used a two-cylinder simple engine, using superheated steam. The new type will not be in operation until the coming summer, after which further details can be obtained by addressing the Railway Auto Car Co., 114 Liberty street, New York. Replying to the questions in detail, the original Ganz motor was of a two-cylinder cross-compound type, both cylinders being steam jacketed. The steam jacket of the high-pressure cylinder was a part of the main channel to the high-pressure valve chamber, the throttling taking place at the boiler, so that the pressure in the high-pressure cylinder was the same as that entering the valve chamber. The low-pressure cylinder was jacketed by the exhaust steam from the high-pressure cylinder, this jacket forming a portion of the receiver. This motor was also equipped with a starting valve, by means of which live steam from the high-pressure valve chamber could be admitted into the low-pressure cylinder.

746. Efficiency of Cross-Compound High-Pressure Superheated Engine.—"Does the combination of a cross-compound high-pressure (350 lbs. per sq. in.), high-speed (900 R. P. M.) steam jacketed motor using highly superheated steam particularly appeal to you as an efficient power plant? In the tests on the C. R. I. & P. this car was guaranteed to give 35 miles per hour fully loaded on 16 pounds of fuel per mile, and fuel consumption was cut to a little over 12 pounds per mile."—*W. R. H.*

Answer.—It has always been a question in the mind of the writer as to the necessity for a higher degree of superheat than that necessary to overcome the condensation. In other words, that so long as the superheat added to the saturated steam will heat the walls of the cylinders and steam chest to a point above that of saturation, it would appear that further superheat is of little, if any, benefit. The necessity for compounding with an engine using superheated steam is another point that is not clear to the writer. In fact, we are of the opinion that simple cylinders using superheated steam would give the same economy as compounding. It is evident that others are of the same opinion also, or the Ganz motor people, who no doubt gave this question some consideration, would not be eliminating the compound feature from their new type of engine and substituting a simple engine for it. In regard to the degree of superheat necessary there are of course various opinions. Mr. Robt. Garbe, locomotive superintendent of the Prussian States railways, who is at present considered one of the highest authorities on superheat, states that the average temperature of 570 degrees F. in the slide valve chest must be maintained in order to insure the homogeneity of the superheated steam, or its freedom from intermixed, wet or saturated portions, repeated trials having shown that coal and water consumption will considerably increase whenever the temperature falls to any appreciable extent below that figure. While we must accept Mr. Garbe as authority on superheated steam, yet we must also give credit to Mr. H. H. Vaughn, of the Canadian Pacific Railway, for his views, as Mr. Vaughn has had more experience with superheated steam than any other one man on the American continent, Mr. Garbe's experience having been altogether in Europe. Mr. Vaughn is a very careful investigator and therefore any statement made by him must be accepted as practically correct. Mr. Vaughn's experience, unlike that of Mr. Garbe, has been that from 125 to 150 degrees of superheat is ample, and on account of the difference of opinion of these two authorities it will leave the question open as to whether or not a higher degree of superheat than 150 degrees is true economy.

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747. Modifications of the Joy Valve Gear.—"There are several modifications of the original Joy valve gear. By a brief outline could you not give me an idea of your preference as regards any particular type?"—*W. R. H.*

Answer.—The Joy valve gear is a simple modification of the Hackworth gear and can be said to be the highest development of the Hackworth motion adaptable to locomotives, as it gives an excellent steam distribution when properly fitted up, the only objection being that the movement of the valve by the vertical play of the main axle is considerably affected when the engine is run over rough track. The Joy modification of the Hackworth gear has been further modified by various designers, but so far as the writer can learn no very marked improvements have been effected. The writer's preference so far as this motion is concerned or any modification of it is that shown in Fig. 1, which is about the highest development that this motion is capable of.

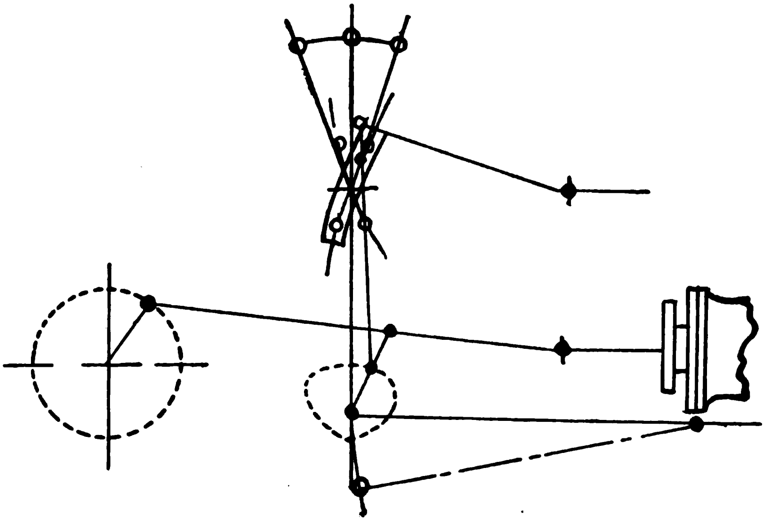

Fig. 1

748. Valve Gears and Cylinders—Clearance. "Does not the inherent defects of the applicable type of valve gear to locomotives prevent the reduction of cylinder clearance below 5 per cent.?"—*W. R. H.*

Answer.—In the opinion of the writer the valve gears themselves do not affect the cylinder clearance, as the cylinder clearance depends more on the construction of the cylinder in relation to the valve seat, that is, the valve seats should be placed in such position as to overcome the greater part of the cylinder clearance, and in this the construction of the valve gears themselves have no part. As for instance, in some engines fitted with what was termed the Stevens gear in use on the Central Pacific about 1884, the cylinder clearance was cut considerably below 5 per cent. of the total cylinder volume. In this type of engines four valves were used on each side, that is, engines had double valve seats placed at the extreme ends of the cylinders in such position that the admission port was very short and practically straight from the face of the valve seat into the cylinder, the steam chest in this case projecting beyond the ends of the cylinders. In the Allfree-Hubbell type of engines the cylinder clearance has been reduced to 2½ per cent., the Allfree-Hubbell being a modification of the Stevens gear referred to above, and more simple, in that the riding cut-off valves used with the Stevens valve motion are eliminated. The general arrangements of ports, however, remain the same.

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749. Advantage of Triple Expansion in Handling the Condenser.—"Does not compounding or triple expansion with its lower terminal pressure and consequent heat allow of a much better handling of the condensing feature of a condenser?"—*W. R. H.*

Answer.—Yes.

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750. Limit of Economy in Steam Pressure.—"Regardless of boiler troubles, etc., is there any particular steam pressure where the heat necessary to boil water in a boiler precludes the possibility of any future economy in a still further raise in pressure?"—*W. R. H.*

Answer.—We can quote no better authority on this matter than Prof. W. F. M. Goss, formerly of Purdue and now of the University of Illinois. In a paper read before the Master Mechanics' Association in 1906, which can be found on page 149 in the 1906 proceedings, Prof. Goss, among others, makes the following statement: "This leads us, then, to a consideration of the question, to what extent will increase in pressure improve the cylinder performance of a locomotive? I believe that a general view of the facts involved in this question may most easily be apprehended by referring to the performance of the ideally perfect engine, and for this reason I have given in diagram (Fig. 2) as the curve *X A B*, the steam consumption per h. p. hour of an engine ideally perfect, using steam at various pressures and exhausting at a pressure of 5 pounds above atmosphere. From this diagram you will see that beginning with a pressure of 25 pounds the steam consumption per h. p. hour of this perfect engine is 40 pounds, and that the steam consumption diminishes rapidly as the pressure is increased until the pressure becomes considerable. For the higher range of pressure, the increase in performance is very slight. For example, if you will scan the upper portion of that curve you will note that from 175 pounds to 275 pounds the inclination of the line is very slight. The performance at the higher pressure is but slightly better than that at 175 pounds. From this statement it appears that from theoretical considerations alone we should not expect any large improvement in the efficiency of the locomotive by merely increasing pressure.

"Turning now to an experimental side of the question and considering what the actual performance of a locomotive may be when served with pressure of different values, I present to you the line *C D*, which fairly represents a series of more than seventy tests, all under pressures ranging from 120 to 250 pounds per square inch, and which have been conducted under the patronage of the Carnegie tests, showing the steam consumption per h. p. hour for the several pressures given. I call your attention also to the form of this curve. Its upper portion you will see is almost vertical. The change in performance when the pressure is increased from 175 pounds to 250 pounds amounts only to 1.3 pounds of steam per h. p. hour. Moreover, I would add that these curves are plotted as shown in terms of steam per h. p. hour, inasmuch as at the higher pressure, a pound of steam represents more heat than at the lower pressure. If the plottings were made upon a heat basis alone, these lines would be even more nearly vertical than they are shown.

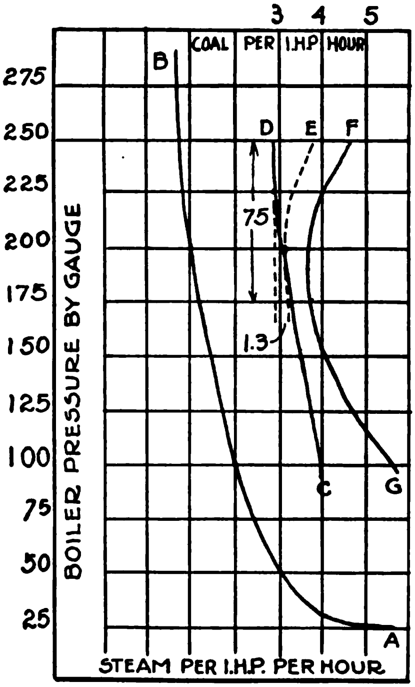

Fig. 2

"The results which are represented by line *C D* are obtained in return for great vigilance in the maintenance of boiler and engine. Small leaks occur, especially at the higher pressure, which, while they may attract but little attention, become the source of serious losses. These leaks and the effect which they have upon cylinder performance are more difficult to deal with as the range of pressure increases so that if we take an actual engine working under conditions of service, the actual performance, as measured by steam per h. p. hour is likely to take some other curve, not the curve *C D*, but some curve, which may be *C E*. That is, the expected gain when the pressure is increased actually becomes a loss through incidental causes, chiefly through leaks.

"Of course, the problem of coal consumption per h. p. hour is after all that which we are after. I cannot present to you any curve of coal consumption which will be as representative as that which I have given for steam consumption, since the data covering coal performance is not yet in hand; but I do present one series of tests. All the tests which were made were made with a given cut-off, about one-fourth stroke—perhaps 15 or 18 tests altogether—and you will note that on the basis of coal consumption as determined from these few tests, we have the minimum consumption at a pressure not greater at any rate, than 200 pounds, and when the pressure is increased above that limit, the coal consumption increases. I should say that the values to which the curve *F G* refers are given at the top of the diagram and not at the bottom.

"This presents to you in rather brief form the performance of a single actual engine as regards cylinder performance and coal consumption. I must call your attention to the fact that this is not a fair and full statement of all of the problem involved; because of the fact that the tests here were run at comparatively low pressure, with a boiler which was designed for 250 pounds pressure—that is, it was lower than a high-pressure boiler.

"Suppose, now, instead of proceeding as has been done with these experiments, there had been a new boiler available for each of these different pressures, which boilers would be constant in weight, but those which were designed for low pressures would be made enough larger in their heating surface to maintain their weight; that is, suppose in this record we had taken advantage of the opportunities which the selection of lower pressure would give for increasing the size of the boiler. It would then appear that all of these lines would show a lower steam consumption and a lower coal consumption, as we go downward. That is, the upper end of these lines would at once move to the right, showing that the point of minimum consumption would be lower than the points, which are shown by them, and as a problem in design of course it is that view which must in the end prevail.

"Summarizing the statements already made and adding others thereto, the following will be found to be true:

1. Very high steam pressures are not essential to the development of high power.

2. The advantages to be obtained from an increase of pressure above any given limit are only such as may be derived from an improvement in cylinder performance and from a reduction in the dimensions of cylinders. For all increments of pressure above 150 pounds, the possible improvement in cylinder performance will be small; above 185 pounds it is practically negligible. As to cylinders, it may be noted that conditions external to the locomotive may sometimes require the use of abnormally small cylinders, but such conditions will not often be a controlling factor. It is true also that small cylinders permit the use of lighter pistons, and hence they tend to simplify the problem of counterbalancing.

3. The disadvantages to be met when the pressure is increased above any given limit are as follows:

(a) An increased weight of boiler for a given amount of heating limits, less heating surface than might otherwise be used and hence a boiler of lower efficiency.

(b) Where feed-water is of poor quality it increases the difficulty attending the maintenance in working condition of injectors and boiler checks.

(c) It complicates the problem of keeping boilers tight, and in general adds enormously to the cost of boiler maintenance.

(d) It increases incidental losses, especially those occurring in the form of leaks of steam or water from boiler and engines. From these considerations it appears that a general solution of the problem of determining what is the most economical pressure for locomotives involves three sets of facts: (1) Those defining cylinder and boiler performance; (2) those dealing with the weight of boilers designed for different pressures and different capacities; (3) the degree of perfection with which the locomotives are to be maintained in service.

"An abundance of data covering the first two of these points is now in hand, while the third probably can never be absolutely defined.

"I may say that during the summer it is expected that an analysis based upon this data to which I have referred will be made, and I am hoping that by fall I shall be able to add to this discussion something that will be more conclusive than that which I give now.

"Meantime, I can only say, in response to the specific question which has been assigned me, that my investigations justify the assertion that a pressure of 185 pounds will give better results in a simple locomotive, using saturated steam, than would be obtained from a pressure of 200 pounds."

According to this, which we have no reason to doubt, there is a point, where a further increase in pressure does not make for economy in fuel.

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Train Rules and Train Practice.

Answers by G. E. Collingwood.

323. A Signal Order.—"We are going to run two sections on No. 1 from initial station to an intermediate junction point; regular train to run as second section. The order used reads: 'C. & E. Eng. 100 and No. 1, at A.—Eng. 100 will display signals and run as first No. 1, A to G.'

"I would like your opinion as to whether or not this is a proper order to use when both engine numbers are known, and also whether or not regular No. 1 can proceed on this order without another order making them second section of No. 1.

"Has second No. 1 right to proceed as No. 1 from G without further orders to do so under conditions as stated?"—*H. J. M.*

Answer.—An order that Engine 100 will display signals and run as first No. 1 A to G, is not a proper order to use when both engine numbers are known. It is a single order example and is intended for use only when the number of the engine which is to run as second section is not known at the time the first order is given. When this form is used it is to be followed by an order, addressed to the engine which is to run the second section, reading: "Engine 200 run as second No. 1 A to G." The order which our correspondent quotes is not authority for regular No. 1 to run as second No. 1 to G.

When a regular train is run as a section from their initial station to some point short of their terminal they may properly proceed to their terminal as the regular train, without further orders, provided that the equipment of their train is such that it is recognized as the regular train. That is, suppose that No. 1 is a local passenger train and gets an order to run as second No. 1 from A to G, this equipment being such that it is recognized as regular No. 1, they may properly proceed from G to Z as No. 1 without further orders. But if the schedule which is being used for two trains from A to G is a schedule which is used for through freight of any description, then the equipment would not be distinguishable from any other and neither train could proceed from G without orders to use the schedule.

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324. A Form C Order.—"Please give me your understanding of the following order: 'Extra 37 East has right over No. 1 G to A, and will wait at C until 10 a. m. for No. 1.'

"No. 1 must clear the extra as many minutes as the extra was required by rule to clear No. 1. No. 1 cannot make C by 10 a. m., why cannot No. 1 use until 10 a. m. to make an intermediate station not named in the order, as No. 1 cannot pass C until 10 a. m.?"—*J. L. C.*

Answer.—No. 1 can use up to 10 a. m. to make C or any intermediate point for extra 37 East. Formerly the rule was held to mean that the time stated only applied at the station named in the order. At least that was the interpretation placed upon it by a great many, the theory being that in case of a regular train the dispatcher might issue an order for No. 1 to wait at C until 10 a. m. for No. 71 and that he could start another section of No. 1 from E on time, therefore No. 71 could only use the order between D and C. But personally I have always given the order the same interpretation which it has now—that is, that the time would apply to any station beyond C. A dispatcher capable of running trains would never issue a wait order to a train beyond E, stating that No. 1 would wait at C until 10 a. m. and then start another train out of D on time as first No. 1 when the train using the time was beyond D. It is a train dispatcher's duty to protect trains and he cannot fully protect them by issuing orders as given in the rules without using good judgment with them, for there is many a loophole left open that the rules do not cover.

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325. Train Crew Did Not Obey.—"Please note the following order put out the other day. There was a misunderstanding between the crews:

"Order No. 1;

"C. & E. No. 357 and No. 121 A;

"C. & E. No. 378 M.

"No. 378 will meet No. 357 at G and No. 121 at B, No. 378 hold main track."

"Is this a proper form of order to use in such cases or should a form C order have been used?

"The crew of No. 357 held the main track on this order. What is wrong?"—*R. E. G.*

Answer.—The form is permissible and there is nothing wrong with it. No. 357 and No. 121 should have both taken siding for No. 378 on this order.

A form C order is not intended for use when it is desired simply to side track a train. It is admitted that it could be used for that purpose and then followed up by a meet order, but that is not what the form C order was originated for.

In connection with this case I wish to call special attention to the fact that the Standard Code does not provide a form anywhere for the side tracking of a train. I have called attention to this point several times for the reason that it is a very common occurrence to side track the superior train at the meeting point, and, as it stands now, there is no authorized form for doing it, with the result that the wording and understanding is not uniform. And besides there should be an explanation of how the side-tracking portion of an order is to be treated when the meeting point is changed without changing the side-tracking portion of the order.

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326. All Three in Effect.—"Please see the following orders and advise me which of the orders are in effect. Is order No. 1 fulfilled or annulled?

"Order No. 1: 'No. 72 run one (1) hour late A to G. Eng. 223, eng. 374 and 25 work between A and G, protecting against each other and against second and third class trains.'

"Order No. 2: 'No. 72 run one (1) hour and twenty minutes late A to G.'

"Order No. 3: 'No. 72 run one (1) hour and thirty minutes late A to G.'

"No. 72 is a third class train. No. 72 proceeds and finds work extra 223 between stations not protecting. If No. 72 had collided with work extra 223, who would have been to blame?"—*R. A. Y.*

Answer.—All three of the orders are in effect. Rule 220 provides that train orders once in effect continue so until fulfilled, superseded or annulled. To annul an order it is necessary for another order to be issued stating that order No. 1 is annulled; to supersede an order a subsequent order must be issued containing the words "instead of ...." and referring to the substance of the order or part of the order which is to be superseded; to fulfill an order the train must actually carry out its provision. So by referring to the three orders it will be seen that all three were in effect until the movements contained in them were executed.

In regard to who would be responsible for a collision between work extra 223 and No. 72, I cannot say definitely without knowing what your form H says. But if your rules are similar to other rules and work extra 223 was not protecting, then work extra 223's crew would be responsible, provided No. 72 was running expecting to find the work extra flagging.

The Standard Code provides that a work train receiving an order to protect against second and third class trains may work on the time of such trains, but must protect themselves against second and third class trains with a flag, and second and third class trains must have a copy of the order and will run expecting to find the work extra within the limits named, with a flag out a sufficient distance to insure full protection.

Before the responsibility could be correctly fixed, it would have to be known whether or not No. 72 was running with due caution and expecting to find the work extra protected by a flag within the territory named in the order; and also whether or not work extra was fully protected by a flag as required by rule 99. Rule 99 requires that a flagman must go out a sufficient distance to secure full protection. If, as our correspondent states, the work extra was not flagging at all, then the crew of the work extra would be responsible; but if they were flagging and No. 72 was running at too rapid a rate of speed through a dangerous part of the work train's territory, then the responsibility would rest with the crew on No. 72, unless it could be shown that the flagman was not out a sufficient distance.

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327. Orders Void when Train Reaches Terminal.—"Will you kindly give me your opinion on the following case:

"Order No. 1: 'Engine 100 will run extra A to B and meet extra 200 south at B.'

"Order No. 2 (to engine 100 at B): 'Engine 100 will run extra B to C.'

"Has extra 100 a right to leave B after receiving order No. 2, regardless of extra 200 south, the idea being that extra 100 north upon arrival at B and before the receipt of order No. 2, loses identity as an extra? I am not quite clear upon this matter and would very much like your opinion."—*R. G.*

Answer.—So far as the rules are concerned, or at least the intent of the rules, extra 100 may proceed regardless of extra 200 when they get order No. 2; but in the interest of safety I have always advised that in such cases the attention of the dispatcher should be called to the matter to check against a possible oversight or a failure to understand the situation.

In considering these cases it must be remembered that regular trains are distinguished by their numbers and dates, but extra trains cannot be so distinguished and are known by their initial and terminal stations, together with the engine number. The engine number is always the same. In a train order and train rule sense when an engine has been given an order to run extra A to B, these two stations constitute the initial and terminal stations for this particular train. And it follows that all train orders issued to this particular train must become void when the train reaches the terminal station, for the rules require that orders must only be issued to this train for the particular use of this train and not for the use of any extra train which is to be subsequently run. Unless this method of handling extra trains is followed we would find ourselves tied up with train orders which have been issued to extra trains on former trips, and the tangle would be one that could not be safely handled; for it must be understood that if any orders are to hold good from one extra to another that all orders must hold good unless they are fulfilled, superseded or annulled. For example, extra 100 with initial station at A and terminal at B, gets an order that No. 1 will run one hour late A to C; when extra 100 gets to B they tie up for the night and the next day get an order to run extra B to C. The one hour of No. 1's time would be good between B and C if orders are allowed to hold over from one run to another, and if No. 1 was on time the next day there would be trouble.

But I hear some one say: "Extra 100 being tied up at B all night is a new extra when they start the next morning, but if they only remained at B a few minutes and got another order to go to C, they would be the same train." I would like to ask, then, just how long extra 100 could remain at B and still consider them the same train? Will they be the same train in a train order and train rule sense if they leave there in one minute after they arrive? If so, why? Will they be the same train if they are there an hour? If so, why not the same train if they are there a week?

A little thought on this subject will prove that under the rules the only intelligent solution to the situation is to consider each initial and terminal station given an extra in a train order as making them a new train; and in connection with this I have suggested an addition to rule 220 stating that train orders held by any train become void when such train loses its existence by limitation of time or place. This would not change the present practice, as it is worked that way now, but it would give us an authorized interpretation and check misunderstanding.

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Railway Club Proceedings

*Transportation.**

Transportation comprises traffic, travel and communication. It is concerned with the movement of persons and things, and with the transmission of ideas. Under this head we have the telegraph and telephone, and the wireless telegraph, as well as water and rail transporation.

A great many years ago Noah went into the transportation business, and it has been growing ever since. Today we have transportation by water and by rail; the force behind it being steam and electricity. Recent experiments indicate that possibly before another decade we will be traveling through the air; but I shall not try to predict the force behind the airship.

I shall confine my remarks, however, principally to railroad transportation. Every man in the land is interested, at all times, in railroads, and the transportation of persons and property over them; the price of whatever he eats, or wears, or uses, the cost and comfort of travel, the speed and convenience with which he shall receive his mail, and the current intelligence of the day, and even the intimacy and extent of his social relations are all closely interwoven. The business employs great numbers of persons. The relative proportion of railway employes has been growing rapidly each year, until now one person in sixty of the population of the United States is employed in the railroad service. The relation of the Government, local, State and Federal, to transportation is so intimate that a study of the transportation service of necessity involves a consideration of some duties and activities of the State; indeed, some branches of transportation, as the mail service, are everywhere carried on by the Government. Whether performed by the Government, or by companies, or by individuals, the transportation service is of a public nature; this is recognized by the State in the franchises giving to such carriers the power to take possession of private property they may need. "The State," to quote the language of the United States Court, "would have no power to grant the right of appropriation unless the use to which the land was to be put was a public one. Taking land for railroad purposes is a taking for a public purpose, and the fact that it is taken for a public purpose is the sole justification for taking it at all." Railroads are obliged to pay a good price for property taken, and therefore try to purchase direct from the owners before exercising their right to confiscate. Wherever you find man, you have transportation, and you will find it graded in accordance with the civilization of the people. Today the Esquimaux's transportation is by sled, hauled by dogs. The North American Indian used poles tied together with thongs on which they piled their goods. In railroading today we must have the telegraph and telephone to enable the officials in charge to view the road, at all points, as a picture, and know where each particular train is located and how it is moving any hour of the day.

Previous to 1852 the Conestoga wagon was the freight car through Pennsylvania, making the trip—Philadelphia to Pittsburgh—in 20 days. Conestoga wagons were used between Greensburg and Mt. Pleasant until about 1870, when the Southwest Branch was built. These wagons, with their white covers and four to six horses, made a picturesque scene wending their way along the old turnpike.

As the result of cheap transportation, those who produce have multiplied their wants. Thirty to forty years ago the settlers in Kansas, Nebraska, and other Western States often lived in "dug outs," with the ground for a floor and sod for a roof, all the personal effects of the family being taken care of under this roof. Today all is changed. With the present highly developed railroad transportation service to aid them, their efforts are far more productive than they would otherwise be. The farmer, owing to this development by the railroads, obtains practically the same prices in the Middle West that are obtained in the East.

Previous to 1870 passenger cars were coupled with links and pins, and a sign was posted in each coach requesting passengers to be seated when the engineman sounded his whistle and before the train started. If you have ever ridden on a long freight train, coupled with links and pins, you know what it meant in the early days of railroads to be on your feet when the train started. The safest place was to be seated and brace yourself against the seat in front. Hand brakes were used, with the result that the train often ran past the station and valuable time was lost. The coaches were lighted with candles. First we had an improvement, the Miller platform and coupler, making the train more rigid; then the air brakes; first the lights were changed to oil, then gas, and later to electricity, until today our first class trains are palaces of luxury, with every convenience at hand, and a passenger can travel thousands of miles without leaving the train, and have all his wants supplied. In order to provide the best equipment, for the comfort of its patrons, the railroads in this country handle up-to-date Pullman sleeping cars, and are hauling two tons of dead weight for every passenger (provided each of the thirty-two berths are occupied) and any person that travels knows how seldom all the berths are in use.

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*Paper by Mr. N. K. Hoffman, Superintendent of Car Service, Pittsburg & Lake Erie R. R.

The year 1830 and a few years before and after, were really the turning point in the career of the human race. From that year civilization began to rise by bounds. In 1819 the first steamboat crossed the Atlantic; in 1829 the first steam locomotive was imported from England, for use on a road built by the Delaware & Hudson Canal Company; in 1830 the Baltimore & Ohio opened a railway line 13 miles long.

Even after the rails were laid, for the first railroad, it was undecided whether to use horses or sails as motive power, experiments actually being made with sails. In 1844 Prof. Morse opened his telegraph line between Baltimore and Washington.

Speaking of steam reminds me of Pat's examination: "Can you tell me what steam is?" asked the examiner. "Why sure, sir," replied Patrick, confidently. "Steam is—why—er—it's wather thot's gone crazy wid the heat."

The first locomotive constructed for actual service weighed from three to five tons; total weight of train, ninety tons. On the Pittsburgh & Lake Erie we handled one car load this summer that weighed one hundred and eighteen tons; weight, car and lading, 138 tons. In actual practice today, on a great many railroads, a locomotive weighing one hundred tons hauls a train of four thousand tons. Early-day railroading differed greatly from that of today. For instance: The Board of Directors of a Michigan railroad balloted for captains of trains, and took the radical step of declaring that no credit would be given the railroad passengers.

Can a railroad executive of today conceive the state of mind of an early-day president of a railroad, owning but two locomotives, being obliged to sell one to a hated competitor in order to pay his taxes?

Communities bound themselves to give aid to railroads, and afterwards found they had bankrupted themselves. Some farmers subscribed for railroad stock and gave notes, and secured them by mortgages on their farms; the roads failed and the farmers lost their property. Afterwards the railroads were reorganized, and today the West owes her prosperity to the vast railroad enterprises that gives her quick transportation to all points.

Railroads have been harassed from the first. When the great bridge was built across the Mississippi, at Rock Island, in 1856, it was but a short time until St. Louis steamboat interests demanded its removal, as a nuisance, and in 1860 the United States Court, District of Iowa, adjudged this bridge a "material obstruction and a nuisance," and defandant was ordered to remove all the piers and superstruction within six months. But Abraham Lincoln, who was counsel for the bridge company, appealed to the Supreme Court of the United States, and a decision at Washington finally reversed the Circuit Court.

While the first steam railroad was operated in England over 80 years ago, in no country in the world are the equipment and appurtenances for railway travel equal to those available in the United States. Foreign countries are gradually adopting the type of cars used in this country. In England, however, they continue to use the four-wheel, small capacity goods cars for freight, and compartment cars for passengers, these being modeled after the old stage coaches.

When railroads first entered the transportation business in this country and you loaded a car on one railroad destined to a point on another road some distance from originating point the shipment was transferred at the junction point, this being repeated by each road until it reached destination. Now this is all changed, and today when you want to make a shipment, there is practically one railway with two termini, the originating point and point of delivery. A shipment will travel from Maine to California in one car. Last year some railroad men undertook to transfer loading at junction points in order to avoid paying per diem on the foreign car. This was a short-sighted policy and was stopped when the management of the roads had their attention attracted to the practice by a loss of traffic.

Several years ago a party of English railroad men visited this district, comparing English methods with those of the United Staes, and looking for something that would be an improvement on their methods. Now in England they usually check the work done by each employe to see that it has been performed properly. They asked how we handled requisitions for cars in this country. When told the yard master was directed to place a particular kind of car on a designated track for a firm to load, they immediately asked how we knew the yard master had complied with instructions. They stated it was their practice to send a man through the district once or twice a day to check the orders and see that cars had been placed as ordered. I have heard it said, when an agent sells a sewing machine on the installment plan in England, a spotter is sent the next day, who goes through the same formality as the salesman, that is, to take the name and address of the purchaser, and number and kind of machine, and reports to headquarters, and a second man is sent to see if the first two have performed their duties in a proper manner.

In the handling of carload shipments of merchandise and mill products we have today a system of checking each shipment that fills all the requirements of our English brothers without the expense and red tape. Today the railroads are handling freight of all kinds with greater dispatch than ever before, this being an age of advancement. Your shipper is demanding that quick delivery be made, and this is true of the low-class commodities as well as fresh meats, fruits, vegetables and perishable freight. Today the railroads are handling many perishable articles in freight trains that were formerly shipped by express, or on passenger trains, and the demand continues for improved service. Take merchandise and other high-class freight. It is the practice of a number of our railroads to follow a car from the time it is loaded until it reaches destination. First the agent reports the car initial and number, the commodity and destination to a designated officer; a report is made to the same officer from each yard, showing the time of arrival and departure, enabling the officer in charge to demand explanation of any delay at terminals. In case a car is damaged en route, requiring it to be set off, a telegraphic report is made to the chief dispatcher, who at once, be it day or night, takes action to have the car repaired and in motion again. It is necessary for the officer in charge of transportation to be able to locate a certain car at any time and predict the arrival at destination, and I tell you we have our hands full at times, for cars will be damaged and wrecks will happen as long as we have railroads. Then our predictions miss the mark, the same as Uncle Sam's Weather Bureau predictions that are nullified by a change in the wind. It often seems that the car we are most anxious to move promptly is the one that gets in trouble, and when you go home at night feeling sure a certain car will reach the consignee in time for unloading in the morning, something unforeseen happens. We recently had a car located in one of the yards and made up in a train of sixty cars, expecting it to reach destination promptly. In starting the train the draw head of this particular car was broken and the car met with six or eight hours' additional delay. Mark you, the one car we wanted moved was the one that got in trouble; the other fifty-nine went through on time.

Expediting the movement of perishable and high-class freight is given very close supervision by the transportation department. The revenue way bill is usually mailed to transfer point, or destination of the shipment; a memorandum bill accompanies the car for the guidance of trainmen and yardmen. In the case of high-class freight it is red, blue, green or some striking color; in addition to this several large trunk lines have a red ball card, others a card showing the date shipped and destination, with heavy red letters, "P. F.," indicating preferred freight. These are applied to the side of car and are more particularly for the guidance of yardmen at terminals, whose business it is to make up trains. While trains are in terminal yards, the memorandum way bill is in the hands of the yard master, who, from the different colors, or other distinguishing features, can, at a glance, tell what freight must be expedited. Hence you have each particular car looked after in the office and out in the yard at the same time. In side carding cars the commodity is not usually named on the cards, as cars containing merchandise would at once be a mark for pilferers.

The transportation of common or dead freight is also being given more attention each year. We find that by holding such freight from ten to twenty hours at terminal yards, and then building it up in solid trains for a given destination, that the movement of this freight is expedited, as you meet with practically little delay at division points, and the time lost at originating points is soon made up.

Speaking of transportation reminds me of a story in that line: A clerk, in a rural town, had a pet calf, which he was training up in the ways of the ox. The calf walked around very peacefully under one end of the yoke, while Mr. Clerk held up the other end; but, in an unfortunate moment, the man conceived the idea of putting his own neck in the yoke to let the calf see how it would seem to work with a partner. This frightened the calf, and elevating his tail and voice, he struck a "dead run" for the village, and Mr. Clerk went along, with his head down and his plug hat in one hand, straining every nerve to keep up, and crying out at the top of his voice' "Here we come!—Plague our foolish souls!—Head us, somebody." In the '60s and early '70s settlers west of the Missouri River were obliged to travel by wagon, using the prairie schooner. It was then a common sight to see these wagons transporting the family and their belongings, with a cow or two tied behind, westward bound. Then, on arrival at destination, they would be unable to purchase seed after tilling the ground, owing to no transportation facilities. Hence the vast tracts of land were used for grazing or left idle. Since the advent of railroads this is all changed. Transportation being low, the farmer obtains a good price for his produce, and the West is prosperous.

The city streets, the country roads and the commercially important lakes and rivers are improved and maintained at the public expense, and steamship companies are subsidized. At first railroads in this country received aid from many of the States. The national government began assisting railroad construction later. Most of the aid given by Congress consisted of grants of land to railroads. Roads west of the Mississippi River were given six square miles of land to each mile of road built. This they sold to settlers at a small price. The railroads were then obliged to wait for years, while the country gradually developed, before they enjoyed the lucrative income of today. For many years the earnings of these roads did not more than pay expenses, but today these same roads are all paying investments, owing to the development of the country, due to their transportation facilities, without which the West would today be nothing more than a grazing ground for stock.

The government also loaned about $65,000,000 to Western roads, which was all repaid by the railroads, although the government lost some of the interest. It was an excellent investment; but today you do not hear of railroads receiving aid from any outside source. In fact, they seem to be common prey of late years. The public, however, is being educated to a higher standard gradually, and we shall, ere long, see a change, and the railroads will get credit for what they have done toward developing this country.

The Railway Business Association has undertaken to make friends for the railroads. If you will take the time to read the excellent address of Mr. George A. Post, of Pittsburg, on October 29th, you will see how they expect to accomplish this. In granting public lands and loaning its bonds to corporations to further railroad construction, the national government, no doubt, sought to accomplish several purposes. One was to secure better transportation facilities for the mails, which at that time were carried on horseback and by stages to Western points; another was to secure transportation for troops (the Indians were committing depredations, rendering it necessary for quick transportation to protect life and property); another was the desire to promote the settlement of the country, and thus increase the wealth and strength of the people of the United States. This has all been accomplished, and the Great West today stands as a monument, due to her transportation facilities by rail.

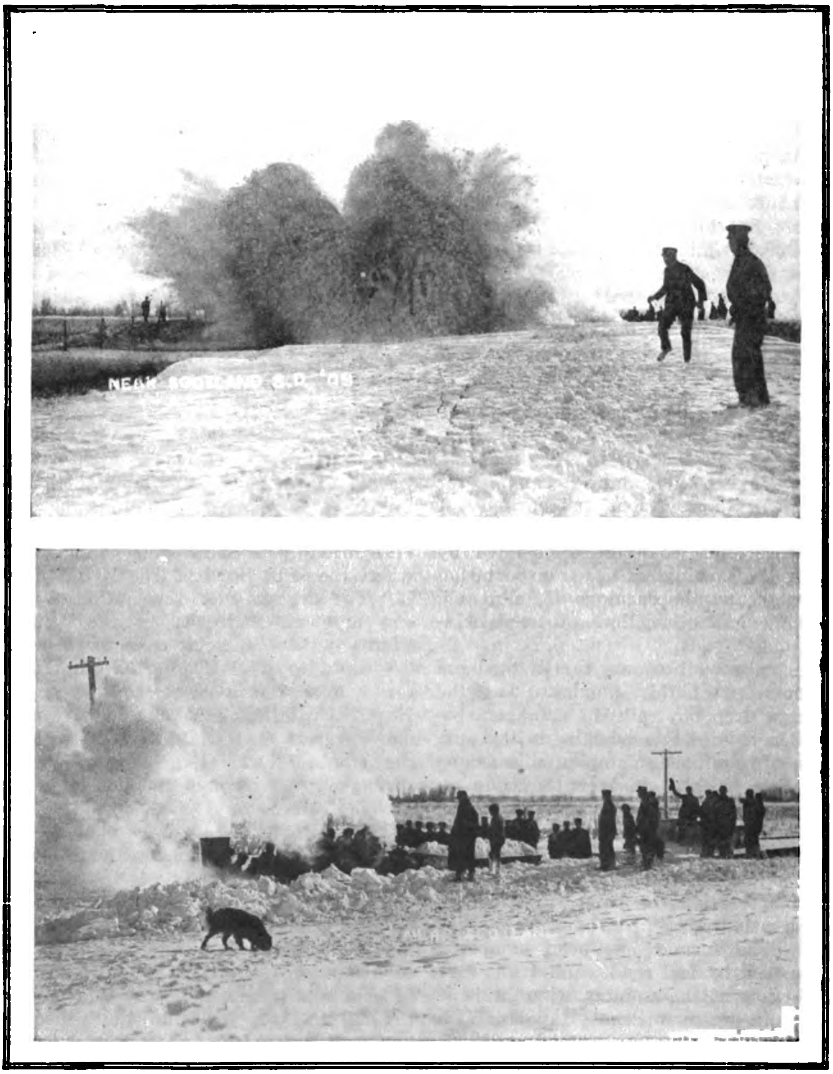
We shall see great strides in the way of water transportation in the next decade, with the Panama Canal completed and deep-water navigation from the Great Lakes to New Orleans, via the Mississippi River. Railroading, however, has during the past eighty years made greater progress than any other means of transportation, and, with the possibilities of steam and electric power, will in the future make vastly greater improvements. In this country we have today over 230,000 miles of railroad (the mileage of the world is about 500,000), with $15,000,000,000 invested; wages of employes, $1,000,000,000 annually; passengers carried, fiscal year ending June 30, 1906, 797,946,116; tons of freight carried, 1,631,374,219; earnings, $2,325,765,167; approximately 70 per cent. of this is disbursed annually in operation and maintenance, 20 per cent. in interest and dividends, leaving the balance available for permanent improvement and surplus. I could not venture to say to what extent this vast sum would be augmented by adding the earnings of the transportation by water and the earnings of telegraph, telephone and other lines of transportation.

The railroad business is the business thermometer of this country. Let the earnings drop off, railroad managers being then obliged to economize in the purchase of equipment and supplies, how soon this is felt all over the country, particularly in the iron and steel districts, they being, to a very large extent, dependent on the railroads, directly or indirectly, for their success.

Transportation is being given more consideration by State and nation every year. The farmer has been hampered in the past by bad roads, and I know of no portion of the country where this is felt as in western Pennsylvania. With the hills and clay to contend with, at certain times of the year transportation of his crops to the railroad is an impossibility, four horses being required to haul what one could do on a good road. Fortunately, the State has come to the rescue, but the grading and building of State roads is slow, and it will be some time before the main thoroughfares are in proper condition. The coming of the automobile should be given due credit in this matter. As the owners of these modern machines from the densely populated districts take cross-country trips they become familiar with the condition of the average country road, hence agitation of the question and good roads follow. No one can venture to say what has been the loss to the rural districts by reason of poor roads, but any person that has traveled over one of our new State roads can see an improvement in the appearance of the country, and if you want to purchase property you will find prices advanced. With good roads the farmer is enabled to market his crops at any season of the year, and thereby secures the highest prices, for with good roads he gets rural free delivery and telephone communication, which enables him to keep in close touch with the market and take advantage of any advance at all seasons of the year.

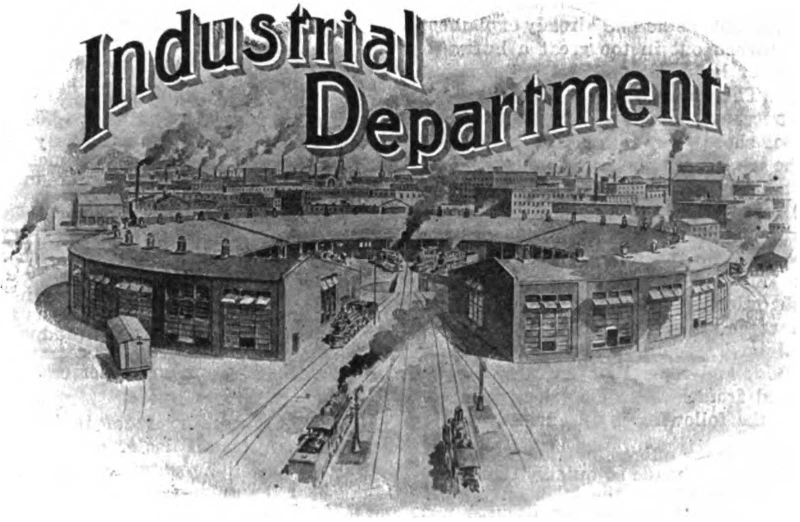
It has been the custom to blame the railroads for the high prices of supplies, but I tell you, gentlemen, that is all wrong. With good roads throughout the country the consumer, as well as the producer, will be benefited, as a careful investigation will show you conclusively where the fault lies and what the remedy is. The average cost for hauling a ton one mile on railroads in the United States is .748 cents; it costs the farmer 5.8 cents to haul a ton the same distance over the average country road. Now, it will not take a scientist or a man of great mental ability to see where the trouble lies. Give us good roads throughout the country and you have the problem solved.

The railroads of today are managed by wide-awake, practical business men, who are ever alert and anxious to take advantage of every new invention that will be an improvement over present methods. We, as railroad men, have no apologies to make for the record of the railroads of this country in the past, and as for the future, you will find the railroads amply able to meet any emergency that may arise. It is evident we have about reached the limit in speed and endurance of steam locomotives, but remember, electricity is in its infancy. A few railroads are now using electric engines for short hauls, and you may expect some wonderful improvements in their aptitude for long-haul transportation.—November, 1908, meeting Railway Club of Pittsburg.



BUCKING SNOW ON THE C., M. & ST. P. RY.

Working in a cut; snow four to ten feet deep, between Scotland and Scotland Junction, South Dakota, February, 1909



DISCUSSION OF CURRENT TOPICS

Look Out for Fraudulent Tactics.

It is strange, but nevertheless a fact, that in strikes and other industrial disputes the sympathy of a majority of retail merchants, particularly the more pretentious amongst them, is with the employing interests and against the toilers, and this notwithstanding the great extent to which the success of their business depends upon the patronage of the working classes. They seem to entertain a prejudice against wage-earners in general and organized labor in particular. Especially is this so in the case of the proprietors of large department stores.

Probably from their associations in the exclusive social "sets" to the charmed circles of which their prosperous circumstances admit them they have become inoculated with that contempt for the "common herd" which constitutes one of the characteristics of "high society." These people as a matter of policy keep union label goods in stock, but in various ways secretly discourage the sale of such goods.

An instance of this kind occurred (to the personal knowledge of the writer) a few evenings ago. A young man when buying a pair of shoes on a recent Saturday night, specified that he wanted to see none but those bearing the union label. The clerk who waited on him fitted him with a pair of shoes which he stated bore that label. Before they were wrapped up, however, the purchaser upon investigation found that they did not bear the label. Then the clerk explained to him that nevertheless they were union made shoes, but that the factory which turned them out had sent them as part of a "rush" order, and hence there was no time to put the label on them. The young man then informed the clerk that unless he sold him a pair of real union label shoes he would go elsewhere to make the purchase. In response to this declaration a pair of union label shoes were quickly forthcoming and promptly purchased. They fitted nicely and were in every other way suitable. Upon reaching home, however, the young man discovered that instead of the union-label shoes which he really purchased the first pair shown him were the ones he brought home, they having been wrapped up for him instead of the shoes bearing the label. As he expected to leave town the following morning he went back to the store on that same night (a distance of thirty-two squares), and was informed by the clerk for the second time that there was really no difference between the two pairs of shoes as far as their being union made was concerned, that they were both from the same factory and made by union shoe-workers, but, as he had already explained, were turned out in too great a hurry to permit of being stamped with the union label. The young man, it is needless to say, returned home with a union label pair of shoes.

The next morning he explained the entire matter to the Editor (being his own son) and in order to absolutely settle the question as to whether or not shoes entitled to bear the union label were ever sent out in consignments known as "rush orders" without the label in cases of emergency, we submitted the matter to Mr. John F. Tobin, General President of the Boot and Shoe Workers' Union, and received from him an official reply, from which the following is an extract:

> "The excuse offered by the clerk that the shoes were made so quickly that there was no time to put the label on is only one of hundreds of similar excuses put out by retail shoe dealers. In the first place, let me say that a shoe that is made as quickly as this would indicate should be a sufficient reason why it should not be purchased, because shoes to be well made are not made with such haste.
>
> "The different processes of manufacture to be successful require that the shoe remains on the last at least ten days in order to get the best results. When shoes are run through hurriedly in the moist condition in which the leather is required to be in order to make it pliable so as to be worked successfully and shaped to the last, and the last is taken out after such hurried production, the shoe never afterwards retains its shape, as it shrinks without the last inside to hold it in form and no good shoemaking ever results from such an excuse.
>
> "The time required to put the union stamp on a pair of shoes is so insignificant as to amount to practically nothing. Shoes sold under any such representations are positively nonunion; in fact shoes under all circumstances and no matter what excuse may be offered, that do not bear the union stamp are nonunion.
>
> "It is a common practice for dealers to show shoes bearing a certain name with the union stamp and then show other shoes bearing the same name, perhaps, or shoes that they represent to be made by the same concern, without the union stamp, and they offer this as evidence that such shoes without the union stamp are union made.
>
> "In no case should this be accepted as evidence, because similarly named shoes may be made in many different factories, the owner of the name simply furnishing the identification marks, such as a steel stamp to stamp a name on the sole, or the strap webbing in which the name is woven.
>
> "You can take this matter up with the shoe dealer you refer to with all the vigor at your command, and you can depend upon this office to sustain you in serving notice upon this dealer or any other dealer that you resent the imposition upon your intelligence when they say that large orders of shoes are sometimes turned out in such a hurry from union factories that they do not wait to put the union label on.
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> "What would one think if a retail dealer should offer him or her shoes turned out in such a hurry that they did not have time to put the heels on them. One excuse is about as reasonable as the other. From a trade union standpoint, the union stamp is quite as necessary as the heels, toe caps or any other essential portion of the shoe."

From the foregoing facts it is very clear that any retail dealer or clerk endeavoring to sell a customer shoes that do not bear the union label under the pretense that they are union made, is guilty of gross misrepresentation, and is certainly not entitled to the patronage of any member or friend of organized labor. Owing to the manner in which this matter has been taken up with the store undertaking the particular fraud referred to, it is by no means probable that the practice will be continued as far as that particular firm is concerned.

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Movement in Minnesota a Step in the Right Direction.

Embodied in the contribution from Bro. Nels P. Larsen, secretary and treasurer of the Minnesota State Legislative Board (appearing in the March issue, page 405), is a plan agreed upon by employers' and employes' organizations of Minnesota for providing compensation for employes injured in the course of their employment. The agreement of these organizations to this plan constitutes a very practical and effective step towards the solution of that most important and weighty problem. It is fully in accord with the recommendation of President Roosevelt in his message to the 60th Congress at the beginning of the second session of that body. The plan proposes that the industries of the state shall be taxed for the creation of a fund from which employes injured in the line of their employment shall receive compensation (in pension form) for such injury in accordance with a schedule to be decided upon. It provides that liability claims be awarded by a commission consisting of three members, one a representative of the employers, another a representative of the employes and the third a "neutral and studious member," such commission, however, to be governed in awarding such claims by fixed rates of compensation in accordance with the established schedule. It is indeed to be hoped that this proposition will ere long develop into a law, and it is safe to predict that the operation of such law in Minnesota will be so successful that it will be but a short time until similar laws will be in force in every state of the Union. It is indeed most gratifying to know and is a very pleasing and auspicious indication that the employers' association of Minnesota is agreed with the labor organizations of that state upon the following points:

1st. That the present system (or rather lack of system) of compensation to employes injured in the line of duty as such should be transformed from the basis of negligence to that of a risk of the industry.

2d. That the majority of the accidents which occur in the field of industry result from the dangers incident to the various classes of employment.

3d. That it is unjust and in every way wrong that the employe is forced to bear the pain, physical suffering and privations, and in addition thereto be compelled to assume the financial risk incident to such accidents.

4th. That it is wrong that the injured employe in the very rare instances in which he recovers damages should be compelled to pay out from "one-quarter to one-half" of the amount he recovers as attorney fees and in liquidating other expenses of his lawsuit, as such cases are almost exclusively taken upon a contingent basis.

5th. That a very small proportion of the money which the employer now pays to secure himself against the result of accidents in which employes are injured goes, under the present system, to compensate the man who is actually injured, and that the economic loss between the amount thus paid to insurance companies and expended in lawsuits and that which the injured employe actually receives "is altogether too great to be consistent with even business expenses or methods," or in other words, that it is now being recognized that as a matter of common humanitarianism the money paid out to such insurance companies as well as that expended in fighting damage suits brought by employes should be utilized in indemnifying the injured man or his family, and that it is vastly better that there be established an equitable fixed system of compensation for injuries than that the employer and employe should become involved in damage suits with each other.

From the fact that the Employers' Association of Minnesota and, as we would also naturally infer, the employing interests of that state generally, are agreed with the labor organizations upon all the foregoing points it would seem that the enactment of a law in accordance with the plan proposed would be a comparatively easy matter, for, as an invariable rule, the main obstacle in the way of the enactment of legislation having for its object the amelioration of the condition of the working class has been the opposition presented in legislative bodies by employing interests, and their representatives within as well as without such bodies. The amount of money that is now being paid by employers to insurance companies for security against the consequence of accidents involving injury to workingmen, as well as that which is expended by them in defending damage suits brought by their employes, and in addition to this the money that is paid by employes as fees to ambulance chasing lawyers and in meeting other expenses incident to litigation, would go a long way towards maintaining a fund from which fixed rates of compensation would be guaranteed the injured employe. The extent to which the misfortunes of the workingman and his family are being exploited, commercialized and traded upon by such parasites as the insurance companies referred to and ambulance chasing lawyers is nothing short of barbarous, and we feel that civilization has reached that stage in its development where it should be stopped, and stopped at once.

Roosevelt's Views.

Ex-President Roosevelt in his last message to Congress discusses this important question in language that leaves no room for doubt as to the necessity of immediate remedial legislation. From his reference to the subject we quote the following extracts:

"There should no longer be any paltering with the question of taking care of the wage workers who, under our present industrial system, become killed, crippled or worn out as part of the regular incidents of a given business. The majority of wage workers must have their rights secured for them by state action, but the national government should legislate in thoroughgoing and far-reaching fashion not only for all employés of the national government but for all persons engaged in interstate commerce. . . .

"Our present system, or rather no system, works dreadful wrong, and is of benefit to only one class of people—the lawyers. When a workman is injured what he needs is not an expensive and doubtful lawsuit but the certainty of relief through immediate administrative action. The number of accidents which result in the death or crippling of wage workers in the Union at large is simply appalling; in a very few years it runs up a total far in excess of the aggregate of the dead and wounded in any modern war. No academic theory about 'freedom of contract' or 'constitutional liberty to contract' should be permitted to interfere with this and similar movements. . . .

"It is inevitable that daily familiarity with danger will lead men to take chances that can be construed into negligence. So well is this recognized that in practically all countries in the civilized world, except the United States, only a great degree of negligence acts as a bar to securing compensation. Probably in no other respect is our legislation, both state and national, so far behind practically the entire civilized world as in the matter of liability and compensation for accidents in industry. It is humiliating that at European international congresses on accidents the United States should be singled out as the most belated among the nations in respect to employers' liability legislation."

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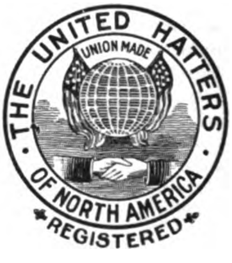
Stand by the Hatters' Union.

The struggle between the United Hatters of North America and the "interests" which are trying to crush that organization still continues. The outlook for victory for the union is, however, very bright. Everywhere throughout the country the stock of the retail hat dealers is very low, and they are clamoring for more goods with which the factories affected by the present strike are unable to supply them. If organized labor throughout the country will stand firmly by the Hatters' Union and refuse to purchase any hats unless those which bear


THE UNITED HATTERS OF NORTH AMERICA
UNION MADE
REGISTERED

THIS LABEL

victory's sunburst will ere long illumine the banners of the toilers in this great struggle.

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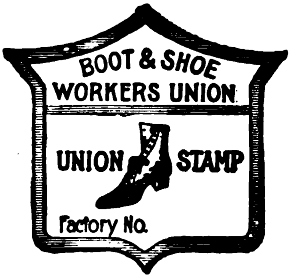
Help These Brothers in Their Fight.

Prospects for the success of the Boot and Shoe Workers' Union in its fight with the W. L. Douglas Shoe Company are now very favorable. Indications point to the fact that the Douglas Shoe Company realizes that it is losing much more through its fight with the union than it would gain by carrying its point against them.

In purchasing shoes there is only one safe and consistent course for the members and friends of organized labor to pursue, as is plainly stated by John F. Tobin, president of the Boot and Shoe Workers' Union, in a letter, an extract of which is embodied in an editorial appearing elsewhere in this issue entitled, "Look Out for Fraudulent Tactics," and that course is to purchase no shoes but those which bear



THIS LABEL.

If this course is followed persistently and unerringly it means VICTORY sure, complete and speedy for the Boot and

Shoe Workers' Union in its present struggle, and if all members and friends of organized labor, when purchasing goods that can bear the union label, will buy none but such as do bear it, the success of union labor in general in its present fight against the forces of greed which are seeking to crush it, is assured.

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We Don't Patronize.

The Hat Manufacturers' Association has declared a boycott against the Hat Makers' Union.

Over their factory doors they have written "WE DON'T PATRONIZE UNION LABOR."

Regardless of what certain so-called judges may say, the duty of every member and friend of organized labor is plain, and that duty is, "DON'T PATRONIZE ANY HAT MANUFACTURERS UNLESS THEIR HATS BEAR THE UNION LABEL OF THE UNITED HATTERS OF NORTH AMERICA."

Purchase no shoes unless they bear the union label, and thus assist the Boot and Shoe Workers' Union in its fight for union principles.

Purchase no hats unless they bear the union label, and in this way help the United Hatters in their fight against organized greed.

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GOMPERS-MITCHELL-MORRISON JAIL SENTENCE

That Justice Wright by his action in sentencing Gompers, Mitchell and Morrison to jail simply utilized the power of his exalted position as judge with a view to the more firmly enthroning the money power and promoting the interests of our American plutocracy is recognized by American citizens generally, and especially deplored and resented by all who prize the great constitutional rights of a free press and free speech. His action in this particular will ever be regarded by lovers of human liberty as a base prostitution of the judicial department of the American government to the promotion of the mercenary interests of "captains of industry" and "princes of finance."

Justice Wright's decision is deduced from a succession of complicated technicalities and based upon absolutely false premises, being also of wearisome length; it is consequently confusing to people not versed in the legal profession. That it constitutes, however, a mere subterfuge under which Wright gratified his very evident desire to serve the plutocracy (to which he owes his appointment to his present position) by crushing labor for the benefit of the specially privileged is very clearly demonstrated in the opinion of a legal authority far greater than Wright even estimates himself to be, and which opinion is quoted in full in an able editorial from the pen of Samuel Gompers appearing in the March Federationist, and which is as follows:

"The liberties of all the people of our country are threatened by Justice Wright's decision denying the right of free speech and free press. If those liberties are to be preserved all our people must be accurately informed as to the issue, and they must be alert to seek the proper remedy. For this reason the editorial comment of the daily press on the decision is of importance, for without doubt many people accept as correct the dicta of their favorite newspaper.

"We are rather disappointed to perceive that so far the editorial comment of the daily press is almost valueless, for the very simple reason that it is apparent on the face of it that most of the editorial writers have not read Justice Wright's decision and have not correctly informed themselves as to the previous history of the injunction upon which the case was founded.

"It is true that the daily editorial writer finds so many topics pressing upon his attention that it is difficult for him to be informed upon all of them. This decision, however, is one of vital interest, and the principle involved will not be settled until it is settled right. It will repay careful study.

"It is trading upon the credulity of the public to assure it that nothing but the boycott is involved in Justice Wright's decision. Those editors who assure the public that free speech and free press are *not* involved leave the inference that they are either too brainless to understand Justice Wright's very plain language on the subject or they are too careless to perceive the menace to their own liberty."

Opinion of Great Legal Authority.

"The following opinion as to what Justice Wright's decision involves is of the greatest interest. It has additional weight as coming from so great a legal authority as Judge James B. Maguire, for many years a member of the California Superior Court, and generally recognized as one of the foremost jurists of the country:

" 'The decision of Judge Wright, of the Supreme Court of the District of Columbia, in the Gompers contempt case is the most far-reaching step yet taken to undermine and destroy the freedom of speech and of the press, guaranteed by the federal constitution.

" 'Primarily it is intended to curb the growing power of organized labor, if not to destroy the labor movement; but it cannot be limited to that purpose. If finally upheld, it must ultimately lead to the general censorship of speech and of the press.

" '*If a court may*, by injunction or otherwise, *determine in advance* what subjects may or may not be discussed, or what may or may not be said in a labor paper, why may it not, in like manner, abridge the freedom of all other publications?

" 'The fact that judges, nearly all of whom are appointed, through influences unfriendly to labor, are out of sympathy with the labor movement, may deem it inexpedient or undesirable to abridge the freedom of other publications is no answer to the proposition that the assumption of power to do so in any case places the entire press of the country at the mercy of an irresponsible power, as great and as arbitrary as the Russian censorship, to be exercised at will.

" 'If the courts can enjoin the publication of any statement in the American Federationist, they can certainly enjoin the publication of the same statement in any other paper; and if they can enjoin the publication of one statement or the discussion of one subject, their power extends to all statements and to all subjects.

" 'The truth or falsity of the enjoined statement is wholly immaterial and is not considered by the court, either in granting the injunction or in determining the guilt of the publisher when cited for contempt of court. The *publication, contrary to the injunction, constitutes the crime*, though the statement may be, as in the Gompers case, absolutely true.

" 'The constitution of the United States provides that "Congress shall make no law . . . abridging the freedom of speech or of the press," but Judge Wright says that this provision does not guarantee the right of anybody to print or publish anything; that it is a mere inhibition upon the direct action of Congress, but leaves Congress free to create courts with power to abridge such freedom by writs having the force of statutory laws. This is arrant nonsense and neither deserves nor needs discussion.

" 'But, says Judge Wright, the defendants are charged with having conspired among themselves and with others to make the publication in question for the purpose of injuring the property (the business) of the Buck's Stove Company, and that, as the publication was but an incidental overt act in execution of the conspiracy, the court had a right to enjoin it, although an individual not conspiring with others might not be subject to such injunction.

" 'This involves the absurdity of holding that an individual citizen may lawfully and rightfully publish an article in a newspaper which it would be unlawful for several persons, having the same object in view, to publish in the same newspaper.

" 'What property of the Buck's Stove Company were the defendants seeking to injure by the enjoined publication? Its business, of course. And how were they attempting to injure its business? By inducing the members and friends of organized labor to withdraw their patronage from the company during its controversy with the unions.

" 'But the Buck's Stove Company has no property right in the patronage of its customers.

" 'If there is any property right in such patronage it belongs to the customers and not to the company with which they may at any time choose to deal, and may be withdrawn by them at will, either with or without reason.

" 'What possible property, or property right, of the company can be injured by requesting a customer to transfer his patronage to another? None.

"'Another argument of Judge Wright is that the enjoined publication was, and was intended to be, an interference with interstate commerce, and was therefore a criminal act in execution of the alleged conspiracy.

"'How did, or could, the publication interfere with or obstruct interstate commerce, assuming, although we deny, that it might be properly enjoined upon that ground?

"'If every person in every state of the Union should, as a direct result of the publication, refuse to purchase any stove or other article manufactured by the Buck's Stove Company, that fact would not in the least interfere with interstate commerce. The company would still be perfectly free to ship their wares into every state in the Union. They might find no purchasers in any of the states, but that is a matter entirely beyond the scope of the interstate commerce laws, and beyond the jurisdiction of the federal government itself.

"'Judge Wright, as a further basis for his decision, appeals to the higher law of necessity, "the argument of tyrants." He contends that, if such injunctions cannot be issued and enforced, there is no adequate protection to the citizen against false and libelous publications injurious to his business. Of course, he does not find that anything published by the defendants was false or libelous. It was manifestly true, and its truth or falsity was legally immaterial in the contempt proceeding. . . .

"'Injunction is not, and never can be, a remedy for libel or slander, but, if it were desirable to adopt such a remedy, the judicial department of the federal government has never been commissioned to legislate upon the subject.'

"The most superficial criticism on our attitude is that we 'are greatly in error,' because the 'court must be obeyed,' and the judge must not be criticised whether right or wrong.

"Substitute the word 'king' for court and judge and a good quotation is at once revived from the old theory that 'the king can do no wrong.' The 'Divine right of Kings' was defended by just such specious arguments as are now adduced to shield the court and the judge from our just protest.

"It is noticeable, too, that the very complacent advice about accepting the mandate of the court, even if it is unconstitutional and void, comes from those who are not suffering any *immediate* injustice at the hands of court or judge. The people who give this sort of advice are they who would be the first to protest loudly were their rights invaded; or, rather, should we say did they realize that their interests were involved, for it is such insensibility to the danger which menaces the whole people which makes effective protest difficult.

"Imagine the mental attitude of an editor, and, by the way, it is some satisfaction that there was but one who took this view that 'After all it is simply Gompers, Mitchell, and Morrison who are deprived of free press and freedom of speech; that it does not involve the people generally.' Is it likely that all the people will be punished at one time? Is that the usual method by which rights and liberties are invaded? Is it not truer to the record of history that when the denial of the liberties of the people has been contemplated by an existing regime, when any tyranny was about to be imposed upon the people, the attempt was first made upon the few; then that denial or tyranny quoted as a sacred precedent for its final extension to all the people? In this case in point, although only Gompers, Mitchell and Morrison have so far been selected by the Buck's Stove and Range Company out of the two million members of organizations affiliated to the American Federation of Labor, yet the prohibition of free speech and free press is intended to apply to every one of this vast number of men and to all our people, and each of them may be subject to just such punishment as has been meted out to the men sentenced to prison.

"It is easy to see where any real thought has been given to Justice Wright's decision, the editorial tone is then entirely different from the flippant and inaccurate comment which fills so many columns of the daily press.

"There is a respectable and growing number of daily papers which give Justice Wright's decision and the attitude of Gompers, Mitchell, and Morrison the consideration which the importance of the subject merits. We have space for only a few quotations from such editorial opinions.

"The following from the Reading Times shows that the real meaning of

Justice Wright's decision is understood in some quarters:

" 'The late decision of Justice Wright in the Buck's Stove and Range Company case, in which he sentenced the three officers of the American Federation of Labor to long terms in jail, is of vital interest to every newspaper publisher and editor in the United States. If the right to free speech and a free press, given us by the constitution, can be set aside by a Supreme Court injunction, thus making the Supreme Court greater than the constitution, it is time for all Americans to wake up and take notice.

" 'If the courts can make a crime out of a constitutional right in one case, they can do the same in any other case. Just now it is the case of Mitchell, Gompers, and Morrison—next year it may be an attack on the freedom of the press from another point. When the liberty of the press is chained up through court injunctions we may as well bid good-bye to a republican form of government. Where the people rule they must have free speech and a free press. Wrong must be publicly denounced, and right defended, or the government will drift into a bureaucracy of the Russian type. . . .

" 'Again, if this late decision is only to try the temper of the American people, to see how far they will submit in having their constitutional rights injunctioned out of existence, it's a bad thing to play with. If the jail sentence was pronounced to try the temper of the people—to stand, if the people submitted to it, and to have the prisoners pardoned later on, if the people set up a howl about it—it is another weak proceeding of the court. If the court is willing to take away the freedom of the press in every case where the people neglect to stand up for their rights, how long will it be before the people are tied up so snugly that they will have no more constitutional rights to defend?

" 'If this country wants true and tried citizens—loyal and patriotic citizens—give them the constitution in all its strength and purity and protective force. Make it too sacred for even the Supreme Court to attack, or political parties to change. Free speech and a free press must be placed safely out of reach of all designing men,'

"The Worcester Gazette says on the right of protest:

" 'The moral right of any man to challenge the highest court cannot be denied. Courts have been wrong many times in history. Men have been punished in all countries unjustly. Decisions have been rendered ever since history began that could not be tolerated by a part of the inhabitants of the country.

" 'Revolt at the time may mean more than a year's imprisonment. It has meant dungeons, torture, and the stake. A few hundred years afterwards the world learns the merits and makes heroes of the sufferers.

" 'So from the larger viewpoint the labor leaders should not be execrated. They are not maliciously defying law. They are not disobeying laws which they know to be just.'

"Along this line of thought the Scranton Times says:

" 'Let those who are pursuing these labor leaders take care lest they make them the greatest men in the nation by making of them felons. Put truth between the four walls of a prison and you lift it up so that all men may be drawn after it. Much has now been done to make these labor leaders stand as the incarnation of iniquity, Actually shut cell doors behind them and they will at once pervade the life of the nation, by the mere fact of being shut up.

" 'For they will then come to represent truth in a manner plain to every eye. The common man will know that these men lie in jail for a crime which is not a wrong—which is only a law-made crime; a judge-made crime.

" 'What have they done that they are to be locked up as felons? They have only told of facts that exist. They have advertised to the world that a certain stove company is unfriendly to organized labor. They have published the fact that union labor is refused recognition at that stove factory; that union men are refused employment. Well, that is true.

" 'That particular factory has drawn the sword against union labor. It has boycotted union labor and union men, but if union labor draws against this enemy its similar and only weapon—the boycott—the union officers who direct this policy of fighting back are sent to prison.' "

. . . .

Notice.

On motion of Senator Newlans, of Nevada, the United States Senate has had printed as a public document, and for free distribution, the various Acts of Congress affecting railroad employes, and orders of the Interstate Commerce Commission made in accordance therewith. It is known as "Senate Document No. 691, 60th Congress, 2nd Session," and can be procured upon application to either of your United States Senators or the Congressman from your district,

H. R. FULLER,
National Legislative Representative.

* * *

Alaska-Yukon Exposition and Organized Labor.

A recent letter to the Editor from Samuel Gompers, President of the A. F. of L., makes clear what the relations are between the Alaska-Yukon Exposition and organized labor. Whenever this difference is adjusted the Magazine will make as early announcement of the settlement as possible. Bro. Gompers' letter is as follows:

WASHINGTON, D. C., March 8, '09.

Dear Sir and Brother—On February 8th I wrote to you in reply to your inquiry in regard to the Alaska-Yukon Exposition, and said that I would write you further at a later date. I beg to advise you that in a letter just received from the Central Trades and Labor Council of Seattle and vicinity, they state as follows:

"I wish to say that the A. Y. P. Fair is 'unfair' so far as this Council is concerned; also the Washington State Federation of Labor.

"It appears that the Building Trades Department here cannot come to any satisfactory agreement with the Fair managers, after repeated efforts have been made to effect a settlement.

"This is a condition that we very much regret, owing to the fact that many men and trades are involved in this large undertaking. Work is being rushed to completion on the Fair in order to have it completed by the time as advertised, June 5th, 1909.

"As far as organized labor is concerned, and the status of the Fair at the present time, it does not look good, and will not realize the anticipation of its managers.

"Much can be said on the matter, but this will give you some idea so far as the trade and labor movement is concerned as to how the matter stands."

Trusting that this information reaches you in time for your purpose, and with kind regards, I am,

Fraternally yours,
(Signed) SAMUEL GOMPERS,
President, American Federation of Labor.

* * *

When purchasing shoes all brothers should be careful to buy none but those which bear the union label of the Boot and Shoe Workers' Union. That union is at present engaged in a fight for its life and the best assistance that can be given it by members of organized labor and other sympathizers with its cause, is to purchase no shoes but those that bear the union label. Elsewhere in the reading columns of this issue is published a cut of the union label of the Boot and Shoe Workers' Union.

* * *

Wisconsin Co-Employe Law Declared Constitutional.

The Wisconsin co-employe law has been declared constitutional by the Supreme Court of that state. Some very interesting facts relative to the struggle leading up to its enactment, etc., are contained in a contribution which appeared in last month's issue of the Magazine from the pen of Bro. J. M. O'Rourke of Lodge 388. Brother O'Rourke for many years past has been conspicuous by the earnest and untiring zeal with which he has persistently labored for the enactment of legislation in the interests of railroad employes. He lost his position in railroad service as a result thereof, and the action of the Supreme Court of his state in upholding the constitutionality of the co-employe law constitutes for the cause of protective legislation for railroad wage earners a victory of which Brother O'Rourke and his co-workers in that cause may well feel proud.

The facts relative to the enactment of the law and the explanation of its operation embodied in Brother O'Rourke's contribution appearing in last month's Magazine are very interesting and will prove particularly so to all brothers identified with the work of our legislative boards.

The test of the constitutionality of the measure came through a damage suit entered by a workman named Michael Kiley to recover damages for the loss of an eye sustained while working for the Milwaukee road. The company's attorneys, Green, Fairchild, North and Parker, contested the case on the ground that the law was unconstitutional, but Judge Hastings of the lower court ruled against them. On December 4th last the case was argued before the state Supreme Court, Kiley's attorneys, Minahan and Minahan, contending that the law was valid, and the court so decided. It is said that the Milwaukee road will appeal to the Supreme Court of the United States. Some of the specific grounds upon which the company's attorneys contested the constitutionality of this law are that it is in violation of the fourteenth amendment, and "that the rule of comparative negligence which makes it possible for a servant of a corporation to recover for injuries sustained by reason of the negligence of a fellow servant was class legislation." If the act stands the test of constitutionality in the Supreme Court of the United States, Wisconsin will have on her statute books a law for the protection of her railroad employes that can be classed prominently amongst the best of its kind in existence today on the North American continent.

Next to the employers' liability feature of the law the most important section thereof is that which protects railroad employes from the operation of so-called voluntary relief departments operated by certain railroad companies with a view to preventing, by methods which are, to say the least, unjust, such employes from securing damages.

The Magazine extends to the railroad wage earners of Wisconsin its warm congratulations upon the victory they have achieved through the action of the Supreme Court of their state in upholding the constitutionality of this law.

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Organized avarice is seeking to crush the United Hatters of North America. Will we permit the annihilation of this organization when we can prevent it? Brothers, remember that you can best assist these organized toilers by purchasing no hats but those which bear the label of the United Hatters.

Much is being done in an attempt to alienate from the Boot and Shoe Workers' Union the sympathy of other labor organizations in its present fight with the employing interests. Remember, brothers, "united we stand, divided we fall." This is a crisis in the life of the Boot and Shoe Workers' Union wherein they need our help. Let us stand manfully by them and absolutely refuse to buy any shoes except such as bear the union label of that organization. In buying shoes there is only one safe course for the members of organized labor to pursue if they are true to their principles as such, and that is to buy none but those which bear the label of the Boot and Shoe Workers' Union, a cut of which is published elsewhere in this issue.

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United Mine Workers' Convention.

The recent International Convention of the United Mine Workers of America held at Indianapolis, was characterized chiefly by the transaction of routine business. Probably the most important action taken of special interest to those outside as well as inside the ranks of that organization, was the adoption of the following resolutions, one being a protest against the Gompers-Mitchell-Morrison jail sentences, the other bearing on the present industrial depression and proposing a remedy therefor:

Gompers-Mitchell-Morrison Jail Sentences.

The United Mine Workers of America most emphatically and unreservedly protest against the sentences and threatened imprisonment of Samuel Gompers, John Mitchell and Frank Morrison, officers of the American Federation of Labor.

The action of Justice Wright in these cases can never be accepted with any degree of justification by the United Mine Workers of America. We maintain that there was no violation of the law of the land by our fellow workmen; and that all their acts complained of were strictly within the rights as guaranteed to every citizen of this country by our constitution and organic law. We hold that the Sherman anti-trust law was never intended by Congress to apply to labor unions; and the construction placed thereon by the federal courts is destructive of the usefulness and only power of organized labor for its protection and advancement.

We further protest against the uncalled for and extreme bitterness of the arraignment of the defendants by Justice Wright as unparalleled in judicial proceedings in the courts of our land. We regard his action therein, and the scope thereof, as a direct blow against our individual liberties as workmen, and against our labor unions. We condemn the penalties imposed as unjust, unreasonable and shockingly excessive.

Notwithstanding Justice Wright's denunciatory opinion, we maintain that the trade unions have been, and are, based on loyalty to the laws of our country; and we are now, as we have been in the past, determined to resent any encroachments on our rights as guaranteed by the constitution of our republic, We denounce government by injunction, as sought to be enforced by some courts, as un-American, unconstitutional and void. We deny the right of courts to issue injunctions against officers and members of labor organizations, while contending for their rights, for alleged offenses, not committed in the presence of the court, without notice to the parties concerned. In seeking to bring about a change in the injunction laws, as interpreted by the courts, we have no desire to attack property rights. They must be safeguarded; but there are other rights that should be regarded—the rights of man.

We can never agree that labor organizations are trusts. They are voluntary in character and formed for the protection, advancement and general welfare of the toilers of the land. We concede the rights of judges to punish for contempt offenses committed in the presence of the court. But we most emphatically deny the right of any court to punish for offenses committed not in the presence or hearing of the court, unless the accused is afforded a trial by a jury of his peers. This right of trial by jury is guaranteed to the humblest citizen by the constitution of our fathers; and we insist on our full rights thereunder at all times and places. This rule was established by the law of the land very early in the history of our country, and was in full force and effect until 1872, since which time courts have issued blanket injunctions and punished for alleged disobedience without granting the constitutional right of jury trial.

We demand of Congress a speedy enactment of law commanding Federal Courts to change their procedure in contempt and injunction cases so that notice shall be served on defendants in labor disputes and a jury trial afforded before punishment is inflicted.

We also demand that all cases of contempt shall be heard and determined by a judge, other than the one issuing the writ, except when committed in the presence or hearing of the court. We maintain that labor organizations are for the betterment of workers; and that men have a constitutional right to assemble together in a peaceable manner to consult and take action for their common good. Striking employes and their sympathizers have the undoubted right, so long as they act in a peaceful and ordinary manner, to resort to all reasonable manner of persuasion. We demand of the courts only such fair treatment in these matters as is guaranteed to other citizens. Congress has long delayed action in these matters, and we respectfully and earnestly demand a full and complete restoration of the constitutional rights of our organizations and members, at once.

Resolved, That the above resolution be adopted by this convention and that the Secretary be instructed to send a copy thereof to the President of the United States, the President of the Senate, the Speaker of the House, and give the same for publication to the newspapers.

Resolutions Bearing on Present Industrial Conditions and Proposing Remedy.

WHEREAS, In the light of the industrial depression that has haunted America for more than a year, millions of willing workers have been forced into involuntary idleness, thereby being denied access to the means of life, and

WHEREAS, Many of those who are victims of this industrial depression have, in self-preservation, become infractors of law, and

WHEREAS, A class of predatory rich who scarcely know the limits of their wealth are co-existent with the countless thousands whose poverty is directly attributable to their failure to find some owner of the means of production to employ them, and

WHEREAS, The denial of the opportunity to willing workers to engage in useful labor springs from the fact that the means with which the necessaries of life are produced are owned and controlled by private individuals, who are not necessary factors in the field of wealth production, but whose only function is to profit by the activity of the working class so long as a market can be found where the product of the workers can be disposed of, and

WHEREAS, The workers receive in the form of wages only a small share of what their labor power with the aid of machinery creates, thus preventing them from buying back out of the markets the equivalent of what they have produced, necessarily causing a glutted market; therefore, be it

Resolved, That we, the United Mine Workers of America, in annual convention assembled, recognize and declare for the necessity of the "public ownership and operation" and the "democratic management" of all those means of production and exchange that are collectively used, that every man or woman willing and able to work can have free access to the means of life and get the full social value of what they produce.

* * *

The Boot and Shoe Workers' Union and the United Hatters of North America are engaged in a struggle for their existence. Greed and avarice is making a special effort to crush out these organizations. Let us see to it that we purchase no shoes but those which bear the label of the Boot and Shoe Workers' Union, and no hats which do not bear the label of the United Hatters of North America.

* * *

Buy from Women's Trade Union League.

The Women's Trade Union League of New York, with a view to placing certain union made goods within the reach of purchasers, has issued the following circular:

"The Label Committee of the Women's Trade Union League recognizes that certain well and favorably known union label articles are not on sale in New York City, and that it will be impossible to stimulate a demand for them until the public is aware of their merits. To stimulate a demand the league has opened a mail order agency for the following:

"PROCITA & CO., Gloversville, N. Y.—Men's and women's union label dogskin and suede gloves. Price, $1.10 to $1.50 per pair. Colors: black, white, tan, brown and grey.

"IDE BROS., Albany, N. Y.—Union label collars and cuffs. Collars sold in half-dozen lots, price $0.75 a half dozen. Cuffs, $1.50 per half dozen.

"WILKESBARRE KNITTING MILLS, Wilkesbarre, Pa.—Men's, women's and children's union label hosiery. Sold only in six pair lots, one dollar and one dollar and a half for six pair. Colors: black, tan, slate and white.

"The chairman of the Label Committee will be pleased to receive cash orders for the above. Orders may be sent by mail or left at 11 Waverly Place between 9 a. m. and 5 p. m., Fridays until 6:15 p. m. Samples on view at 11 Waverly Place. Catalogs sent on application. Goods will be mailed direct to purchasers by manufacturers.

DO NOT FORGET

that in patronizing these goods you are not only strengthening the United Textile Workers of America, the International Glove Workers and the International Union of Shirtwaist and Laundry Workers, but the whole organized labor movement, and its most effective weapon, the union label. *The label is now in jeopardy. Give it your support.*

"Should you wish to order other union label articles not to be had in retail New York shops, please communicate with

"MISS ELIZABETH DUTCHER,
"Chairman of Label Committee,
"11 Waverly Place, N. Y.

"The Label Committee has at 11 Waverly Place a constantly revised directory of stores in New York carrying union label goods. Telephone 3128 Spring when you want to buy a union label HAT, shirt, pair of shoes, etc., and don't know where they are to be had in your vicinity."

From the foregoing circular it will be observed that the goods specified therein can be ordered by mail from any part of the country.

In a separate letter to the Magazine on the subject the officers of the League have the following to say:

"This is a disinterested attempt to 'boost the label,' not a money-making scheme. We realize that the decision against the boycott and the hatters' strike has brought the attention of organized labor to the label as never before, and now that its conscience is aroused, we propose to make it unnecessary for any union man to wear scab clothing. Our idea is that once a man has actually worn union collars or hosiery he can go into a shop and demand the label with more sincerity and force than he could if he had never actually tried the goods. Our agency is, therefore, a temporary one only. We wish merely to introduce the goods to the consumer.

"We will be pleased to come to any union meeting, exhibit the goods and take orders, or we can always show samples at the office, 11 Waverly Place. Office is open until five o'clock every day except Friday and Saturday; Friday it is open until six p. m. and Saturday until four p. m. Catalogues will be sent on application."

In a letter recently received from Bro. Frank Morrison, secretary of the American Federation of Labor, that officer urges support for the Women's Trade Union League and gives the assurance that the league is endeavoring where established to do and is doing good work for the labor movement.

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*Ed, the Machinist.**

He had no particular talent. He was just an ordinary machinist. But Ed Douglas was more highly respected by the two thousand men in the shop than any other chap in the place. His was one of the names that were familiar to pretty nearly every fellow working in that big plant. Ed was not popular with the men because he set out to make himself popular by always agreeing with his shopmates. Indeed, he frequently went full tilt against their opinions, and, principally, against their actions. Often I have seen him approach the fellow who had just ripped out a string of oaths and rebuke him, although never with a suggestion of pharisaical supremacy. He was simply trying to show the blasphemer that it would pay him to cut out his foolish, senseless swearing.

He did not belong to any of the fraternal organizations, but I have known him to spend many a night with a sick shopmate. Frequently he left in the home part of the not overabundant cash in his pocket, but, better than that, he left a smile on the face of the tired, discouraged nurse-wife—the children wished that he might come again, and the sick man felt the cheer of his presence.

He was an arbitrator in personal disputes in the shop, and the boys never repudiated his decisions. Not infrequently he dared approach the boss in behalf of a supposedly wronged fellow workman. The boys admired his disinterested nerve. Somehow, he seemed to know when the rest of us had met with adversity, or even the smaller discouragements which made life seem hard. Always was there a strong, cheerful word which usually braced up the fellow who thought that the whole world had gone wrong. The apprentices were particularly fond of him, because he appeared to have a lively interest in their affairs. Never did he seem to hand out wisdom in large chunks, with an air of patronage or paternalism. Never was there a suspicion of cant. Ed was just a sane, healthy-minded, strong-hearted Christian workingman, who felt that there was a place for Christian living outside of the church building and away from the Sunday services.

May his kind increase. We need them. The sympathetic touch of a shopmate counts for more than most of us imagine. Every morning brings its weight of woe, and every evening its burden. No matter what the cause, the need is ever the same, and relief is usually found in the simple, manly message of love and sympathy manifested in the life of the fellow who works by our side. At least it will help, for it is doing just what the Great Carpenter did and what He would continue to do were He upon earth. That's what made Douglas, the machinist, a bigger factor in the lives of those two thousand workingmen than any other single individual. It paid him, too. Anyway, you'd think so if you could see his face while he worked—worked for men and for God—just as a machinist.

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*Railroad Labor Interests in the Courts.**

Assumed Risk — Damages. — Mrs. Sedalia Carter, surviving wife of T. O. Carter, brought suit against the Missouri, Kansas and Texas Railway Company in her own right and in behalf of her two minor children and the mother of the deceased, to recover damages for personal injuries resulting in Carter's death. The company pleaded contributory negligence and assumed risk. The trial resulted in a verdict in favor of the company as against the mother of deceased and in favor of Mrs. Carter for $19,000, apportioned as follows: $10,000 to her and $4,500 to each of her minor children.

The evidence showed that on the morning of the accident Carter was killed while serving the railroad company in the capacity of fireman on one of its freight trains, at a railroad bridge on its line of road between Greenville and Mineola. He had been in the railroad service in different departments for about eight years prior to his death. For the past four years he had been firing on a locomotive engine. For about seven or eight months next preceding his death he had been in the service of the company, firing an engine of one of the local freight trains running between Greenville and Mineola. The train made the round trip daily, except Sunday, and left Greenville about 7 o'clock in the morning. The company's track runs in a southeasterly direction from Greenville to Mineola, and runs in this direction at the bridge where deceased was killed. The train on which he was fireman left Greenville on its regular run to Mineola on schedule time, and when it reached Haynes spur, a distance of about nine miles from Greenville, the train stopped and did some switching. The spur is about one-half of a mile from the bridge across the Sabine, where the deceased was killed. The deceased was putting coal in the firebox of his engine as the train left the spur, and at the time he was smoking his pipe. After the train had gone 400 or 500 yards from the spur, and when about half way between the spur and the bridge, the deceased was seen with his head out of the cab window on the fireman's side looking back. This is the last time he was ever seen alive. The train consisted of 25 cars, being about 700 feet in length, and the caboose was attached to the rear end of the train. At the bridge the train was running at the rate of 18 or 20 miles per hour. The track from Haynes spur to the bridge was slightly down grade. The conductor controlled the movements of the train, and usually, upon leaving switches and stations, got up in the cupola of the caboose, and gave signals which were taken both by the engineer and fireman, and it was their duty to keep a lookout for signals, as well as the duty of the fireman to keep a close lookout for the train at all times, to see that it was all right, and it was his duty on leaving stations and switches to look back and see if the train was coming along all right; and the fireman performed the duty of keeping a lookout to the rear of the train by extending his head and a part of his body through and leaning out of the side cab window. If he should be on the space intervening between the engine and tender, he catches hold of the handholds on the tender and the cab, and leans out to get a view of the train. If the fireman wants to get a good view, he has to look out and put his head and body out beyond the side of the cab, and he cannot get a good view and know what is going on without extending his head and part of his body out. It is the duty of the fireman to keep a lookout, except when he is busily engaged in keeping up steam. His duty is to keep looking both ways. It is the duty of men running an engine on both sides to keep a watch. That is their instructions, and they look out through the window; sometimes put their heads out. The conductor often sits in the cupola. If the fireman wanted to see the cupola from the cab window, he must put his head and part of his body out. Ordinarily the conductor stays in the cupola when leaving a station, and signals may be expected in the cupola, and, if he signals there, you can get them from him in the cupola. The engineer is not supposed to look for signals between stations. It is not the fireman's duty to wait until something happens before he makes a lookout. His seat is about 8 inches below the cab window. He could turn around and look backward, or he could look through the side window. That is where he makes his observations from, ordinarily. If he wanted to look back at the train to observe signals while he was sitting on his seat, he would probably look back through the side window in the cab; lean out for that purpose. It was his duty to know what was going on. If he wanted to get a view of the train, he would be more likely to lean out. The side window in the cab is about two by three feet.

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*By the Rev. Charles Stelzle.

*Prepared for the Locomotive Firemen and Enginemen's Magazine by Geo. H. Murdoch, New York, N. Y.

The only other persons, except the deceased, who were on the engine after the train left Haynes spur, were the engineer and the head brakeman, and they were on the engineer's side of the engine on the opposite side of the boiler, which is five feet high, from the fireman's side, and they did not see the deceased after leaving the Haynes spur, and did not miss him until the train had gone a mile beyond the bridge. They immediately backed the train to the bridge, and found the body of the deceased in the water in the bed of the river. There was a cut to the bone about two inches long over the deceased's left eye, and his head was bruised and the skull broken and crushed just behind the left ear. There were no other wounds on the body, except what appeared to be a burst blood vessel on the throat, which made a bulge in the region of the larynx. On the same day of the accident, and soon thereafter, in making observations, a damp, greasy looking splotch, spot, or discoloration was discovered by several witnesses on the first column on the fireman's side of the north end of the bridge. It was about 8½ or 9 feet above the track, and on the corner of the post next to the track, and about 20½ inches from the side of the engine cab. This spot or splotch was from 1½ inches to 2 inches long, extending up and down on the northwest corner of the first post on the fireman's side. When the post was wet with dew, this spot showed to be greasy. It remained on the post for several days after the accident. At the same place on the post there was a slight indentation on the rough surface or fibers of the wood, and a very small splinter, about the size of a pin, had been knocked off of the northwest corner of the post, and it looked to be fresh. Twelve or 15 feet south of the post with the splotch on it, and on the same side of the track said post was on, there was a small spot of blood on the iron girder of the bridge. The body of the deceased struck the ground in the mud about 20 feet south, and beyond where the blood was seen on the girder and slid into the water. There were no indications or evidence that the deceased struck any other part or portion of the bridge, or that his body struck anywhere else until it fell in the mud in the river. Deceased's pipe was found on the side of the bank of the river between the post and the blood on the girder. The bridge where the deceased was killed was a combination span, made of wood or iron. There were four wooden end posts, one at each corner of the bridge, and they leaned toward the center of the bridge at an angle of about 45 degrees. There were four upright posts on each side of the bridge between the two end posts which were a little further from the track than the end posts. On each side of the track were iron girders extending the full length of the bridge between the end posts. It was not shown when the bridge was built, nor when it had been inspected or repaired prior to the accident. The end posts at the north end of the bridge were 1½ inches nearer together than the end posts at the south end of the bridge, and the end post at the north end of the bridge on the fireman's side was an inch closer to the track than the end post on the engineer's side, was out of plumb, and leaned west toward the track. The distance between the outside of the rail to the end post on the fireman's side where deceased was killed was four feet four inches. The track was four feet nine inches wide, and the cab of the engine from outside wall to outside was ten feet, and the height of arm rest in the window of the cab of the engine where the fireman sat was eight feet and two inches. The cab window was two feet by three feet. Immediately north of the bridge the dirt was washed out from under the ends of about thirteen ties, and four or five of the ties were loose under the rails, and would give and shake with the weight of a man standing on the ends of them. The track for 200 feet before approaching the bridge on the north was on a dump, was uneven, first one side and then the other being an inch to one-half inch higher than the rail on the east side; that is, next to the fireman's side opposite the first post on the north end of the bridge was one inch lower than the rail on the west side. The testimony of Cantrell, Kennedy and Herndon, the only witnesses who testified on this point, is to the effect that if the track was in the condition above set out, it would cause the engine when running over it to rock, swing and sway. The track immediately north of the bridge had not been resurfaced since the month of June or July prior to the accident in November, and there had been a great many heavy rains in the meantime. The inspection car called the "Dinky" was to follow the train, and it was known by the train crew before they left Greenville that it was to follow their train, but they did not know just how far behind it would be nor how near the train it would approach.

The theory of the case adopted by plaintiff was, in substance, that the company negligently constructed the first column or post of the north end of the bridge where T. O. Carter was killed, and on the side thereof next to the fireman's side of an engine when running south, so near the railroad track, or, for the want of attention and repair, permitted it to get out of plumb, and so near the track, that a fireman could not, with safety, perform the duties required of him, or that because of the defective condition of the track and the proximity of the post thereto such duties could not be safely performed; that while the deceased, Carter, was standing on the intervening space between the engine and tender of the train upon which he was at work, and leaning out for the purpose of observing signals, or to see that the train was all right—that is, that its several cars were coupled together and moving along without accident or hindrance—or that while with a portion of his body extending or protruding through the window of the engine cab for that purpose, as was his duty to do, his head came in contact with said post or column of the bridge, and he was thereby killed as alleged.

The case was appealed to the Supreme Court of Texas, which affirmed the judgment and, in part, said:

"The evidence, although circumstantial, is sufficient, we think, to establish with reasonable certainty, as correct, the foregoing theory of how and under what circumstances the unfortunate accident resulting in Carter's death occurred. The determination of these questions was not left to mere speculation and conjecture. On the contrary, the facts and circumstances established by the evidence and relied upon by appellee reasonably lead to the inference that the injury which caused the death of T. O. Carter was due to his head striking the post of the bridge in question as he was leaning out from the engine looking for signals or for the train as it was incumbent upon him to do. As shown by our conclusions of fact, except when engaged in keeping up steam, it was the duty of the deceased to keep the lookout as contended by appellee. To perform this duty, it was necessary and usual for him and the other fireman, if at his seat in the cab, to extend his head and a part of his body through the cab window. If standing on the space intervening between the engine and tender, he would catch hold of the handholds on the tender and the cab and lean out to get a view of the train. The post of the bridge with which appellee claims the deceased's head collided was an inch closer to the track than the end post on the engineer's side, was out of plumb and leaned west toward the track, and came within about 20½ inches of the cab window when passing that point. So near did it come to the cab that it is reasonable to conclude that, if the deceased was looking out of the cab window or from between the engine and tender, his head, if occupying the usual position, could have come in contact with the post. Upon this post at a height consistent with the height the deceased's head would probably have been in keeping the lookout enjoined upon him was a greasy looking spot or discoloration which might have been made by the head of a person coming in contact with the post. A very short time before the accident occurred deceased was seen with his head out of the cab window on the fireman's side looking back, which would place his head in a position to be struck on the right side thereof, if it should come in contact with the post. While greater injury to one's head might have been expected by the blow which is claimed to have caused Carter's death than was found upon his head, yet it is shown that the back of his head was bruised and crushed, and we find no evidence that he struck any object other than the post, except the iron girder some 20 feet south of the post, until he struck the ground. Certainly this and the other evidence in the case tended to show that the deceased came to his death in the manner alleged."

104 S. W. 911.

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Contributed

EMPLOYERS' LIABILITY ACT AND RIGHTS OF RAILROAD MEN THEREUNDER*

It is of the utmost importance for a railroad man to know what can be collected if he gets hurt or killed, and also how to enforce collection. When alive and well he is able through his railroad organization to protect himself and obtain justice for himself. When he is hurt or killed the condition is entirely different; and at present no substantial assistance in securing indemnity from the employing company is given by the railroad employes' organizations to an injured man, or to the family of a man who is killed. The Federal Employers' Liability Act will, if held constitutional, revolutionize the rights of injured employes and of their families if killed. As it now stands, the statutes of the various states on this question are materially different, and the interpretation put on the statutes vary in the courts of different states. The Federal Act applies to every State in so far as railroads engaged in interstate commerce are concerned, and the construction which will be put on it by the United States Supreme Court will be followed in every State, both in the State and Federal courts. It is very important, therefore, to know:

First. Will the United States Supreme Court hold the act to be constitutional?

Second. What does the act mean in detail?

Third. What is a wise course for the employe to pursue to protect himself, and in the event of his death to protect his family?

The Employers' Liability Act is as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That every common carrier by railroad while engaging in commerce between any of the several states or territories, or between any of the states and territories, or between the District of Columbia and any of the states or territories, or between the District of Columbia or any of the states or territories and any foreign nation or nations, shall be liable in damages to any person suffering injury while he is employed by such carrier in such commerce, or, in case of the death of such employee, to his or her personal representative, for the benefit of the surviving widow or husband and children of such employee; and, if none, then of such employee's parents; and, if none, then of the next of kin dependent upon such employee, for such injury or death resulting in whole or in part from the negligence of any of the officers, agents, or employees of such carrier, or by reason of any defect or insufficiency, due to its negligence, in its cars, engines, appliances, machinery, track, roadbed, works, boats, wharves, or other equipment.

Sec. 2. That every common carrier by railroad in the territories, the District of Columbia, the Panama Canal Zone, or other possessions of the United States shall be liable in damages to any person suffering injury while he is employed by such carrier in any of said jurisdictions, or, in case of the death of such employee, to his or her personal representative, for the benefit of the surviving widow or husband and children of such employee; and, if none, then of such employee's parents; and, if none, then of the next of kin dependent upon such employee, for such injury or death resulting in whole or in part from the negligence of any of the officers, agents, or employees of such carrier, or by reason of any defect or insufficiency, due to its negligence, in its cars, engines, appliances, machinery, track, roadbed, works, boats, wharves, or other equipment.

Sec. 3. That in all actions hereafter brought against any such common carrier by railroad under or by virtue of any of the provisions of this act to recover damages for personal injuries to an employee, or where such injuries have resulted in his death, the fact that the employee may have been guilty of contributory negligence shall not bar a recovery, but the damages shall be diminished by the jury in proportion to the amount of negligence attributable to such employee: *Provided,* That no such employee who may be injured or killed shall be held to have been guilty of contributory negligence in any case where the violation by such common carrier of any statute enacted for the safety of employees contributed to the injury or death of such employee.

Sec. 4. That in any action brought against any common carrier under or by virtue of any of the provisions of this act to recover damages for injuries to, or the death of, any of its employees, such employee shall not be held to have assumed the risks of his employment in any case where the violation by such common carrier of any statute enacted for the safety of employees contributed to the injury or death of such employee.

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*By Burton Smith, of the Atlanta Bar.

Sec. 5. That any contract, rule, regulation, or device whatsoever, the purpose or intent of which shall be to enable any common carrier to exempt itself from any liability created by this act, shall to that extent be void: *Provided*, That in any action brought against any such common carrier under or by virtue of any of the provisions of this act, such common carrier may set off therein any sum it has contributed or paid to any insurance, relief benefit, or indemnity that may have been paid to the injured employee or the person entitled thereto on account of the injury or death for which said action was brought.

Sec. 6. That no action shall be maintained under this act unless commenced within two years from the day the cause of action accrued.

Sec. 7. That the term "common carrier" as used in this act shall include the receiver or receivers or other persons or corporations charged with the duty of the management and operation of the business of a common carrier.

Sec. 8. That nothing in this act shall be held to limit the duty or liability of common carriers or to impair the rights of their employees under any other act or acts of Congress, or to affect the prosecution of any pending proceeding or right of action under the act of Congress entitled "An Act relating to liability of common carriers in the District of Columbia and territories, and to common carriers engaged in commerce between the states and between the states and foreign nations to their employees," approved June eleventh, nineteen hundred and six.

Approved April 22, 1908.

First.

Will the act be held constitutional?

There are nine judges of the United States Supreme Court. A majority controls in the decisions of the court. Four of them held that the first act was constitutional. Only a bare majority of five held that it was not constitutional. Of those five, two, Justice White and Justice Day, held that Congress had the right to legislate on the relation of master and servant when engaged in interstate commerce, and that the only reason the act was unconstitutional was that it applied to all carriers, whether engaged in interstate commerce or not. On this ground, and this ground alone, they thought it unconstitutional. They clearly said that with this trouble corrected, the act would be constitutional. The first act was approved on June 11, 1906, and after it was held to be unconstitutional the present act was passed and approved April 22, 1908. This second act was specifically limited to interstate commerce and to employees engaged in interstate commerce. It is safe, therefore, to say that Justice White and Justice Day will hold the new act constitutional, and that Justices Moody, Harlan, Holmes and McKenna, who held the first one constitutional, will not change their minds. They will of necessity approve the new act, making six out of nine in favor of it. The three who were against it were Justices Brewer, Fuller and Peckham. Justice Brewer has always been recognized as strongly in favor of corporations in all issues between them and employees, and he now very probably dominates Chief Justice Fuller, whose mental vigor has been largely decreased by growing age and increasing infirmity. But proceeding upon the theory that Justices Brewer, Fuller and Peckham will still be against the act, we have six for and three against it, which ***assures us that the court will hold it constitutional.*** This would seem doubly safe when it is remembered that there were in the House and Senate which enacted the measure some of the most eminent constitutional lawyers this country has produced; lawyers who have given long and profound attention to constitutional questions. With the opinions of the Supreme Court before them, they sought to draft an act measuring up to the demands of those opinions. In this they have succeeded.

Second.

Construction of the act.

Railroad employees are familiar with the old or common law fellow-servant rule. By the provisions of the Employers' Liability Act this rule is abrogated and the railroad company is responsible for the negligence of one of its employees causing injury to another. Furthermore, one of the great hardships in most of the states has been the fact that where an employee knew of defective machinery he could not recover. To illustrate, an engineer and a fireman go out with an engine which is in bad condition. They know it is in bad condition, but the company will not repair it and the necessity of carrying on the work causes them to run the engine. If trouble comes by reason of these known defects and the engineer and fireman are injured, under the old rule they could get nothing, because the knowledge of the defective machinery deprives them of that right. Under this statute this rule is modified and in most cases the risks of employment are not assumed by the employee; a knowledge, therefore, of a defective condition will not as a general rule prevent recovery.

Again, under the old laws, any negligence of the injured employee prevented recovery. Under this law if the employee was negligent and the other employees were negligent the injured employee is not prevented from recovery, but what he gets is reduced in proportion to his own negligence. Under the old rules in most states unless a man had a wife or child or parent there could be no collection if he was killed. It thus frequently happened that a railroad man had near relatives dependent upon him, such as sisters, grandparents, aunts and even cousins, and in the event of his death they could get nothing. Now his administrator can collect for the benefit of any relations who are dependent on him.

Third.

What should a railroad employee do? My advice to a railroad employee, if only slightly injured, even if he has a good claim, is to bring no suit, but to accept the best settlement he can get out of the company and hold his job. It takes as much time to put a little case through the courts as a big one and a man who has sued a railroad company had just as well understand that he will always be at a disadvantage when working for that company. They hold it up against him and do not forget it. If, however, a man is badly hurt (and all that I am about to say now applies to his family if he is killed), he needs a lawyer at once. Of course the railroad's claim agent will tell him he did not need a lawyer, promise to "treat him right," but all the same you can count on the fact that before they got a doctor they had their claim agent and lawyers making up a defense. Even if a case is to be settled, the railroad man without a lawyer is at a great disadvantage because the railroad company will have the best of legal talent. In getting a lawyer, he should go to the best he can find. Very frequently railroad men let questions of personal friendship or advice of other people induce them to go to inefficient lawyers. In this event they are of course at a great disadvantage, for a lawyer without special experience or ability, when he goes up against railroads and railroad lawyers, is very apt to have his client's case wiped off the map. Go to the best lawyer to be found, and if it should happen that the lawyer called upon is so related to railroads that he cannot represent you, find another of the same type. Indeed I have often thought that every railroad man should, *while he is well and has plenty of time to consider the question, select the lawyer* whom he wishes to represent him or his family should occasion require. The careful man provides by will for a named executor to look after his property. How much more important to provide a plan for the protection of the interests of himself, if injured, and for the interests of his family if taken from them by sudden death. Let him carefully select his lawyer, go to him and tell him "I want you to represent me if I am hurt or killed, and if anything happens to me I want you to at once communicate with me, and if I am killed, communicate with my family." And let the employe tell his family of this agreement. When this is done the lawyer to whom he has spoken can with propriety immediately upon an injury take charge of the case; if the injury is slight the lawyer will at once determine that no further legal advice is needed, and if the injury is serious he will at once investigate the facts, as does the railroad company, and be ready to show the truth in behalf of his client. It often happens that before the injured man is able to look into his affairs important facts have been covered up or glossed over. Frequently prompt possession of facts will secure a settlement. Of course lawyers of standing cannot seek an injured man unless such an agreement as I mention above has been made. Unfortunately the injured man too often finds himself in the hands of those undesirable members of the profession who run after people who are injured. Any lawyer who gives attention to such litigation will take it for a fee conditioned on collection. With the exception of a very few states this is perfectly legal. Of course railroads think conditional fees are very wrong, because they think an injured man should really have no lawyer; this is very natural. They have the best of legal talent always at work for them and with the injured man not represented, or not represented until they have things as they want them, defeating his case is often easy money. When the victim of a wreck is between the sort of lawyer who runs after injured people and the railroad claim agents who try to take advantage of his injury to make a settlement, he is certainly between the devil and the deep blue sea.

It is not necessary for a man to sue where he lives. *There is often advantage in suing in another state.* If a man sues in the state where he lives the case can be removed to the federal court. But if he sues in some other state then it cannot be removed to the federal court. No railroad man with a case wants to get into the federal court. It is not necessary here to criticise the federal courts, but the fact that the railroads make a rush for these courts is pretty sure proof that they are courts to be avoided by the injured man. Railroads can be sued under the laws of nearly every state whereever they have lines or have agents. *In most of the commercial centers all of the big lines have agents.* Right here in Atlanta nearly every railroad in the United States has an agent and can be sued here, and the same statement applies to other states. If a man is injured in a state or lives in a state where the courts and juries are unfriendly, he should arrange, by letter, if necessary, with some lawyer in some other state. It is as easy to write and get a lawyer as it is to see him.

This is not said to encourage litigation, because every man who has dealt with a first-class lawyer knows that he discourages litigation.

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The Garnishee Law of Texas.

I have noticed a great deal of comment in the press on the activity of the Retail Merchants' Association of Texas, and the garnishee law of that state. Nearly every railroad organization in Texas is opposed to such a measure. Now let us look at both sides of the question and see the results of such an action. First, what would it mean to the laboring man? Just this—if he were trading with Mr. Jones, and no matter if he had been prompt all the while in settling his account each pay day, should he get sick and fall behind and the garnishee law is enforced, Mr. Jones can attach his wages and refuse to furnish him further commodities, thus bringing anguish and hunger to his wife and babies. No matter where you get a job with a railroad company the law applies just the same. If it only applied to deadbeats then I say it would be a good law and let us have it, but on the other hand if it applies to every one it will cause many a babe to cry for bread and many a mother to go to bed without her supper. So I say, let every union man in Texas fight against such a measure, and more especially let the firemen of Texas show their colors as others have done. Tell me what a poor working man has got outside of the little wages he earns from day to day. Of course, as long as he is able to keep up everything all would be well, but let him fail and then watch results. Let us, therefore, brothers, live for the ones we love and protect them from the savage money gatherers, and our reward in the world to come will be waiting for us. I am strictly against the measure.

J. R. SOWELL.

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Are the American People Greater than the Constitution of the United States?

In the House of Representatives on January 29, 1909, Representative J. J. Jenkins of Wisconsin, chairman of the House Judiciary Committee, in general debate in the Committee of the Whole House on the state of the Union, spoke at great length on a subject of vital interest to the laboring classes of the country, namely, the proposed anti-injunction bills and amendments to the Sherman anti-trust law, which were presented at the first session, 60th Congress. Mr. Jenkins in opening his remarks stated that he wanted to place before the people of the country the bills themselves and the question lying with them, and desired to justify the Judiciary Committee in its attitude toward legislation of that nature. He quoted "A gentleman who has obtained fame in the Supreme Court of the United States" as follows: "I am absolutely sick and tired of hearing about a constitutional question. They have forgotten that the American people are in power in this country, and that it is a question for the American people and not for any individual, not for any committee or any Congress of the United States to say what is constitutional or not. I say that the American people are greater than the Constitution of the United States."

Mr. Jenkins remarked, "I could not possibly agree with that gentleman." While it is a positive fact that Mr. Jenkins is recognized as a competent authority on constitutional questions, and it would seem presumptuous to question his assertions, still we may be justified in entertaining a suspicion that perhaps there may be more truth than fiction in the statement made by the "gentleman who obtained fame in the Supreme Court of the United States." After stating the bills in question he proceeded to specify the constitutional questions involved. Further on he defined the powers of Congress and of the Supreme Court as given by the Constitution of the United States in Articles I and III. The learned gentleman said in part: "I have been brought up to believe—and my education in this House has been such—that the Constitution of the United States is the highest law in this country." It would hardly seem possible that our forefathers established the Constitution one hundred and twenty years ago with the intention that it would be unalterable in future ages. No doubt they realized that some of the provisions of the Constitution might work political, economic or social injustice when applied to conditions which might be created, or to circumstances that might arise at some future date, when they placed in the hands of the people the authority to amend the Constitution as given in Article V as follows:

"The Congress, whenever two-thirds of both houses shall deem it necessary, shall propose amendments to this Constitution, or, on the application of the legislatures of two-thirds of the several states, shall call a convention for proposing amendments, which, in either case, shall be valid to all intents and purposes as parts of this Constitution, when ratified by the legislatures of three-fourths thereof, as the one or the other mode of ratification may be proposed by the Congress."

It would appear from the foregoing that Congress is vested with the power as representative of the people to enact amendments to the Constitution, but to quote Mr. Jenkins further, he says: "As a member of the House I have felt like giving consideration to the very deep and important constitutional questions involved, and I have no interest in this question beyond that I want the people of this country who are interested in the perpetuity of American institutions to know what questions have been presented to the Committee on the Judiciary. I want them to know that every gentleman upon that committee has carefully, conscientiously and earnestly considered each and every one of these propositions for himself." And further: "The only question is as to their constitutionality. Those interested for and against the several bills have ably presented their respective views upon the merits, and I very much regret that the important constitutional question that I believe disposes of all the bills alike has not been discussed. What is said with reference to the bills has no relation whatever to the District of Columbia or the territories." (Cong. Rec., pp. 1,642 and 1,643, 2d ses. 60th Cong.)

According to information at hand Republican caucuses were held on May 20 and 21, 1908, in the House chamber to discuss the proposed anti-injunction legislation, and Mr. Jenkins and Representative C. E. Littlefield, of Maine, led the opposition against it. All the anti-injunction legislation was referred to a subcommittee on the judiciary. Mr. Littlefield was appointed as its chairman by Mr. Jenkins, and it was a well-known fact that Mr. Littlefield was opposed to legislation of this nature. In a speech made by him before the American Founders' Association, and published January 1, 1907, in "American Industries," he spoke in part as follows: "I said in my campaign, and I say it now, I said in the beginning that I was opposed to this bill, H. R. 4,445 and 18,752, and I oppose them now, and that if elected to the House of Representatives I should continue to oppose them." And in a speech made at St. Louis, Mo., during the 1st session, 60th Congress: "By the way, this Pearre bill and all these other bills are in the hands of a sub-committee of which the humble individual now addressing you is chairman, and they are in a good place, and more than that they will continue to stay there."

Do you wonder now that a man has any self-respect of his own who has the responsibility of helping formulate federal legislation and who does not hesitate to say that as long as that infamous proposition remains in his charge as the chairman of the sub-committee of three it will never come out and start even to become a part of a law? "As long as I am a member of the House, legislation like that shall never become a part of the law of the United States if I can help it." Yet Mr. Jenkins says: "I want the people of this country to judge for themselves, and at least give the Committee on the Judiciary of this Congress credit for at least being honest with these great matters." Is the House Committee on the Judiciary justified in its attitude toward legislation of this nature when some of its members were unalterably opposed to the legislation, regardless as to whether a constitutional question is involved or not? It was a violation of the rules of the House to appoint Mr. Littlefield on the Committee on the Judiciary or on its sub-committee, for Rule 26, Manual and Digest, Rules and Practices of the House of Representatives, 60th Congress, reads in part: "Those who take exception to some particulars in the bill are to be of the committee, but none who speak directly against the body of the bill." It is, therefore, a constant rule that no man is to be employed in any matter who has declared himself against it, and when any member who is against the bill hears himself named of its committee he ought to ask to be excused. It is to be sincerely hoped that each member of the House Committee on the Judiciary will receive their due portion of credit for their "careful, conscientious consideration" of the constitutional questions involved, and it is to be more sincerely hoped that the time is near at hand when thirty million working men of the United States will make it known that their will is greater than the Constitution of the United States.

W. F. WESSELL,
Lodge 633, B. of L. F. and E.

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The Boycott in American History.

Senator Sponsor, Presidents Headley and Eliot, say nothing of Post, Parry and Van Cleave and other gentlemen who were eloquent or hysterical in denouncing the boycott as "hostile to the spirit of American institutions." Presume they forget the American history they must have learned in grammar school if not at their mother's knee, In fact, one of the most striking episodes of the early struggles for American independence took the form of a boycott—a boycott which directly affected innocent persons in order that through them it might strike and injure the real enemy—a boycott, it may be added, which involved coercion of "the disinterested public," and was even accompanied by physical violence.

When the British Government resolved to make the American colonists contribute to the public revenues by imposing a slight tax upon tea and certain other articles imported into America, and yet refused the colonists the rights of representation and self-government which they desired, the advocates of independence—who were then but a minority of the population, but a very active and efficient minority as well as a growing one —did not confine themselves to passive resistance or moral suasion. They did not at once appeal to arms, because they knew they had not yet the strength to make such an appeal successful, and because they believed their purpose might be accomplished without actual insurrection. The word "boycott" was then unknown, but the thing, by whatever name it might be called, suggested itself to the patriots as the best means to defeat the government, either by the home government surrendering its pretensions to tax the colonists without granting them representation or else by provoking it to more drastic measures which would incite the masses of the colonial population to demand and work and fight for national independence.

Without any sanction of law—nay, in plain defiance of the law—they organized societies whose members were pledged not to buy a pound of tea or any other article upon which duty had been paid. They carried on a vigorous agitation to extend the membership of these societies and enforce their pledge. They did not stop with this. They branded every man or woman who refused to accept the pledge and boycott duty-paying articles, as an enemy of freedom and a traitor to colonial interests. They made the name "loyalist" as odious as "scab" or "blackleg" has ever since become. They ostracized those who bought duty-paying goods, refused to trade with them, to give them employment, to maintain social intercourse with them, published satires and lampoons against them, mocked and insulted them in public meetings, in the streets, even in the churches, and by all means sought to compel those whom they could not persuade to join in the boycott.

In a double sense this policy worked

injury to others than the British government, against which it was directly aimed. In so far as it succeeded in cutting off the sales of tea and other dutiable articles it caused heavy loss to British and American merchants who had in the ordinary course of their legitimate business bought such goods and imported them and paid the duty on them as required by law. On a still larger scale did the boycott injure vast numbers of colonists who cared nothing about independence or representation, who did not mind paying a few pence a year in taxes, and only wanted to be let alone to live their lives in their own way without meddling in politics or being meddled with by politicians. These were, against their own will, forced to take sides and either to share the hardships and help bear the burdens of the struggle for independence or else to endure persecution at the hands of the active patriots.

Nor did the boycotters stop even here. On more than one occasion they resorted to intimidation or violence against revenue officers, against merchants who submitted to the imposition of duties, or against citizens who sympathized with the government. One particular riot fomented and participated in by these boycotters has been immortalized in our school histories and in patriotic song and story, and has been held up before us in our childhood days as a splendid example of civic virtue on the part of our Puritan forefathers, under the name of the "Boston Tea Party."

The Boston Tea Party was an unlawful and violent assembly, a riot in the strictest sense of the word. Its object was to destroy property and not the property of the British government, but that of certain law-abiding business men who wanted to "carry on their own business in their own way," and its purpose was very effectually executed.

Far be it from us to decry the Boston Tea Party or to say a word in dispraise of those riotous boycotters of ours. We are as proud of them as any fourth-grade school teacher or any frock-coated Fourth of July orator in the land. They adopted the necessary means to a desirable end and they made a good job of it. That some personally innocent persons suffered loss or inconvenience was those innocent persons' misfortune and nobody's fault. As the French say, "You can't make an omelet without breaking eggs," and the omelet was worth what it cost.

We would only remind the eminent gentlemen who now discuss the labor question and declaim against the boycott as inhuman, cruel, cowardly, un-American, and we know not what else, that they are treading on dangerous ground, and that if the boycott is to be condemned, many of the brightest names in our national history will have to be blackened along with those of the labor-unionist of the present day.

GEO. O'BERG,
Member Lodge 91,
108 East St., San Francisco, Cal.

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That Garnishee Law.

The brother from No. 6 wants to know what others think. The writer believes that No. 6 is honest in his opinion, but lacks information and experience. May I ask why do we pay our dues into the B. of L. F. and E. (the best labor order. in the world)? Because it is law. Notwithstanding the solemn obligation we take, ninety per cent. of us pay because of the law. What is law? Common sense.

The writer has been a member since 1877 and held the office of collector many times and knows how hard it sometimes seems to be for some to pay dues, but not so hard to "blow" themselves. I well remember when our lodge went broke because of a sick benefit. Nearly all of the members got sick at once. The greater per cent. of American people live beyond their income. Germany is the best debt paying country on earth, with no suffering—America is one of the worst, with plenty of suffering.

Remember that it is not what we make, but what we save. That garnishment law calls for ten per cent. It means nothing, only the moral effect. Who can't pay ten per cent. on an honest debt. We ought to pay cash, then we would not live so high. Eighty-five per cent. of retail merchants fail on account of credit. This garnishment law has been the making of many homes instead of breaking them. It has educated people to study economy. Of all the different orders the writer belongs to, the Brotherhood of Locomotive Firemen and Enginemen is his choice. We should consider it an honor to be a member. I look for my Magazine each month with interest. It seems to get better all the time, and with Bro. W. S.

Carter at the head of our Order great prosperity awaits the B. of L. F. and E. I hope I will always be able to keep up my dues.

As a "highball" to close with let me say no honest man should fear the garnishee law, for an honest man can always as a rule get credit, and when he is in distress his creditors will willingly carry him and stand by him. The letter from 637 has the right ring—read it.

W. E. SULLIVAN,
Member Lodge 43.

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Notice to Our Members in Arkansas.

LITTLE ROCK, ARK., Feb. 25, 1909.

To the Officers and Members of all Lodges in Arkansas:

Dear Sirs and Brothers—I have the pleasure to send you herewith a copy of a bill introduced by Senator Toney of Pine Bluff, Jefferson County. By his efforts the bill has been put through and became a law on approval by the governor February 19, 1909. I ask you to remember Mr. Toney as one of our friends who is fighting our battles, and by the passage of this law has done more for the poor working man than you can ever repay.

You will kindly hand a copy of this law to every member of our Brotherhood in this state, so they can make themselves familiar with their rights under it.

A. N. DEMERS,
Chairman Arkansas State Legislative Board.

"Section 1. Whoever, whether principal, agent or attorney, with intent thereby to deprive any resident of this state of his or her rights, under the statutes of this state on the subject of the exemption of property from levy and sale on execution, or in attachment, or garnishment, sends or causes to be sent out of this state any claim for debt to be collected by proceedings in attachment or garnishment or other mesne process, when the creditor or debtor or person or corporation owing for the earnings intended to be reached by such proceedings are each and all within the jurisdiction of the courts of this state, shall be guilty of a misdemeanor and upon conviction thereof, shall be fined for each and every claim so sent out of this state in any sum not less than ten dollars nor more than fifty dollars.

"Sec. 2. Whoever either directly or indirectly assigns or transfers any claim for debt against a citizen of this state for the purpose of having the same collected by proceedings in attachment, garnishment or other process, out of the wages or personal earnings of the debtor, in courts outside of this state, when the creditor, debtor, person, or corporation owing the money intended to be reached by the proceedings in attachment are each and all within the jurisdiction of the courts of this state, shall be guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not less than ten dollars nor more than fifty dollars.

"Approved February 19, 1909."

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Work of Texas Joint Labor Legislative Board.

Below is given a summary of the results accomplished by the Joint Labor Legislative Board of Texas in its work before the 31st session of the Legislature of that State, which has just adjourned. The following measures were passed:

A bill prohibiting railroad companies from operating trains with less than a sufficient crew to safely handle them, known as the Full Crew Bill.

A bill requiring railroad companies to apply safety appliances, such as air brakes and automatic couplers, to trains engaged in intra-state traffic, to conform to the Federal law on this subject.

A bill making it unlawful for any railroad company to use any locomotive not equipped with an automatic self-dumping and self-cleaning ashpan, which can be dumped and cleaned without the necessity of any employe going under such locomotive and thereby placing his life and limb in great peril.

A bill amending the present black-list law so as to require corporations to furnish discharged employes, on demand, a written clearance or letter stating the length of time employed in each position or department, and whether such service in each such position or department has been satisfactory or not.

A bill creating the office of labor commissioner, whose duty it shall be to collect and publish information relative to labor, similar to laws now in force in a large majority of the States of the Union.

A bill requiring railroad companies to do all their repair work in Texas. This will give Texas laborers the great amount of work heretofore done in other States.

A bill to prevent railroad companies from using inexperienced locomotive engineers and conductors except in case of an emergency.

A bill to better protect the health and safety of persons employed in and around mines, known as the Mine Inspection Law.

A bill amending the state fourteen-hour law and making it conform to the federal sixteen-hour law.

A plumbers' inspection bill and a mechanics' lien bill.

A bill allowing reasonable attorney's fees to be recovered in cases where the amount of such claims shall not exceed $200 for personal services or for labor rendered.

The defeat of a well-planned and adroit effort to repeal the constitutional provision exempting wages from garnishment.

The defeat of four insurance bills, introduced by old-line insurance companies, which would have been detrimental to our organization.

JOSEPH S. MYERS, Chairman.
Texas Legislative Board, B. of L. F. and E.

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Miscellany

Be a Hog.

It is doubtful that a more striking illustration has ever been given of the extent to which property is so much more highly valued than human life under our present economic system than that presented by a comparison given in a recent Monthly Bulletin of the State Board of Health of Indiana by Dr. Hurty, secretary of that board. Dr. Hurty is one of the most fearless and successful public health officials on the North American continent and also one of the most practical advocates of humanitarian principles.

Dr. Hurty's comparison is embodied in the following:

The Young Mother and the Fat Hog.

NOT A FABLE.

One time a little mother, who was only twenty-five years old, began to feel tired all the time. Her appetite had failed her for weeks before the tired feeling came. Her three little girls, once a joy in her life, now became a burden to her. It was "mama," "mama," all day long. She never had noticed these appeals until the tired feeling came. The little mother also had red spots on her cheeks and a slight, dry cough. One day, when dragging herself around, forcing her weary body to work, she felt a sharp but slight pain in her chest, her head grew dizzy, and suddenly her mouth filled with blood. The hemorrhage was not severe, but it left her very weak. The doctor she had consulted for her cough and tired feeling had said, "You are all run down; you need a tonic." For a fee he prescribed bitters made of alcohol, water and gentian, This gave her false strength for a while, but it checked out her little reserve. When the hemorrhage occurred she and all her neighbors knew she had consumption, and the doctor should have known it and told her months before.

Now, she wrote to the State Board of Health and said: "I am told that consumption in its early stages can be cured by outdoor life, continued rest and plenty of plain, good food. I do not want to die. I want to live and raise my children to make them good citizens. Where can I go to get well?" The reply was: "The great Christian State of Indiana has not yet risen to the *mighty economy* of saving the lives of little mothers from consumption. At present the only place where you can go is a grave. However, the State will care for your children in an orphans' asylum after you are dead, and then in a few years a special officer will be paid to find a home for them. But save your life—*never.*" "That is a cranky idea," for a member on the floor of the Sixty-fifth Assembly said so. "Besides," said he, "it isn't business; the State can't afford it." So the little mother died of the preventable and curable disease, the home was broken up and the children were taken to the orphans' asylum.

A big fat hog one morning found he had a pain in his stomach. He squealed loudly and the farmer came out of his house to see what was the matter. "He's got the hog cholry," said the hired man. So the farmer telegraphed to Secretary Wilson of the U. S. Agricultural Department (who said the other day he had 3,000 experts in animal and plant diseases), and the reply was, "Cert. I'll send you a man right away." Sure enough, the man came, He said he was a D. V. S., and he was, too. He had a government syringe and a bottle of government medicine in his handbag, and he went for the hog. It got well. It wasn't cranky for the government to do this, and it could afford the expense, for the hog could be turned into hams, sausage, lard and bacon.

Anybody, even a fool, can see it would be cranky for the State to save the life of a little mother; and it could not afford it, either.

Moral: Be a hog and be worth saving.

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A Text Book on Household Science.

The above is the title of a little pamphlet of 18 pages recently published by the Carbona Products Company. The book contains some very valuable articles on such subjects as "The Care of the Cellar and Laundry," "The Care of the Kitchen," "The Care of the Dining Room," "The Care of Floor Coverings and Draperies," "The Care of the Bedroom," "The Care of the Sick Room and the Patient," "The Care of the Bathroom," "The Care of the Wardrobe," and "The Care of the Attic." These articles contain a world of useful information for the housekeeper and have been written by women who teach these subjects in schools to future housekeepers. The instructions given, if followed out, will certainly prove must conducive to good health and happy life. They cover every detail in connection with the arrangement, management, conducting and maintenance of each of the departments of the home.

This little booklet will be sent to any address upon receipt of ten cents. Send your remittance to the Carbona Products Company, No. 3 and 5 Burnet street, Newark, N. J.

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*Our Old-Fashioned Mother.**

One of the prominent journals of this country published one of those pleasingly cynical articles on "The Passing of the Old-Fashioned Mother," in which it says: "At the time she existed there was, in reality, a necessity for some one like her. Now, however, that we are educated so early and there are so many enlightened methods about all things, we really do not need help from home. The newly born infant will soon be able to rise from his crib and go, himself, to the nearest hospital, where he will have his tonsils removed, be properly vaccinated and inoculated with the latest serums and go back to his push-button and radiator all ready for business."

There is a vein of humor in the above quotation that attracts our attention, and enough truth in the "hits" at our progressive civilization to provoke a broad smile. But it is by no means the plain, sober truth, and should not be taken for such.

Mothers, like everything else, change. But the change is more in their manner of expression than in themselves, and the world, in any generation, will never outgrow its need of them.

When Napoleon said, "What France needs, more than anything else, is good mothers," he only gave vent to the cry of the ages. America is in the same plight today, some may say. It may be true the "old-fashioned" mother has passed away. Some of us remember her and thank God for her, as we recall her plain attire, her kindness blended with severity, her regular visits to the bedroom where the candle or dim oil burned low, how she bent down over the coverlets of the old-time trundle bed, tucking us in carefully, and then the gentle kiss and a loving prayer as she left us. All this seems as if it were only an incident of yesterday. We cannot forget how she dealt with us, spanking us when we needed to be, mingling her tears with ours when we were in trouble, and patient with all our faults. She was untiring in her industry, absorbed in her house cares, genuine in her piety, and cheerful under the most trying circumstances. Her children rise up and call her blessed. But she has gone and a new woman comes in her place.

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*By Member, Lodge 218.

At first glance we may deprecate the change, for the world at large always does that toward anything which is new. But if we are fair to this "new" mother, however, we will soon realize that she is still the "old-fashioned" mother with some improvements. In this we are not thinking of the "four hundred" or "Who's who." The idle rich, like the idle poor, are in a class by themselves, and are not to be considered except as we bestow pity upon them for their misfortune. The great bulk of American women of today, who are queens of the countless happy homes of the land, are as worthy of praise and commendation as any of their predecessors. It is true they may take more note of the fashions of the times, dress better, travel more and live in a larger world than did their mothers. They undoubtedly give more time to the consideration of civic improvement and human betterment about them, but the charge is not true that she neglects her home. *Mother* still lives—lives to love and foster and mold the destinies of the home circle. She may appear considerably different from the mother we remember before her, but she is the same kind of a mother in heart and mind. Why should she not be?

This "new" woman is the daughter of the "old-fashioned" one, and she married the son of another of the "old-fashioned" mothers. No, mother has not passed away. She is still with us, thinking the same loving, if perplexing, thoughts, and performing the same needed tasks, if not in the old way it is because the new way affords more advantages and a wider usefulness. She is the mother of our children, and is weaving into their lives, day by day, lessons of thrift, sobriety and good cheer, yet not forgetting the things of the spirit. She is the inspiration of the husband and father in his efforts as a bread winner, and in her he finds the guiding hand, steadied by a true heart, which points to hope and courage when the world buffets and distracts us. It is her work, devotion and prayers that build the bulwark of the home, and because of them the home is the guarantee of the republic's future.

It is because of this mother and the sons she is rearing at our fireside that the grand old order of the Brotherhood of Locomotive Firemen and Enginemen flourishes. Behind man's fraternalism is woman's devotion. Our Brotherhood fosters good will because it protects the highest type of love this old world knows. Back of every fraternal order is the home, and the center of that home is the wife and mother.

She still lives—radiant in all her conquering and noble influences.

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HYGIENE, ESPECIALLY IN SCHOOL CHILDREN*

Children are of unusual importance from the standpoint of hygiene and sanitation. They are unusually susceptible to most preventable diseases. Especially is this true of those diseases which are highly communicable. Consumption causes a much larger number of deaths and entails far greater money loss than does smallpox. Nevertheless the greater communicability of smallpox makes health departments guard it more closely than they do consumption. Consumption can be neglected without infamy; smallpox cannot.

School Inspection.

Most towns of twenty thousand and over now have school inspection. This inspection is for contagion in school children. The principle involved is that in the schools a large number of susceptible individuals are gathered together. It therefore furnishes a convenient and economic way of getting at these susceptibles. The usual method is as follows:

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*By Dr. W. A. Evans, Health Commissioner of Chicago, in The Public Health.

The children are casually looked over by the teacher in charge of a room. This teacher sends to a given room all those that appear ill, those who have been absent and those from infected premises. The school doctor examines the children sent to this room and excludes such as are capable of spreading contagion. If there are school nurses they supplement the work of the teachers by a closer supervision of possible contagion. An indirect result is that every child being required to give an account of his absence from school, truancy is greatly decreased. The temptation is very strong to return a child to school before it is safe for the other children. When a child is well of diphtheria from its own standpoint it may be still far from well from the community standpoint. It has taken antitoxin, the throat has cleared up promptly. As the antitoxin was given early, the child was not profoundly poisoned by the disease, and a few days after the onset it is well enough to want to play. Air and sunshine and school would help that young one. But live, active, virulent diphtheria bacilli are still present in about one-half the cases. Such children are more liable to spread diphtheria than those who have been violently sick, because they are strong enough to travel wider.

[Children should be kept very quiet for not less than three weeks after recovering sufficiently from an attack of diphtheria as to be able to be out of bed, as there is great danger of death from heart failure if they are permitted to romp or play or if they are subjected to shock or excitement. Quite a percentage of deaths in diphtheria cases have occurred in this way.—Editor B. of L. F. and E. Magazine.]

Danger of Contagion.

About three per cent. of scarlet fever give "returns" after all "scaling" has stopped. They are still capable of spreading the disease. We know now that the contagion may linger in the nose, throat and ears long after scaling has stopped. I have before me a bulletin of the Chicago department dated December 12, 1908. I note that during the preceding week the school medical inspectors excluded 442 children from school. These were in school because the parents and in some instances the doctors thought they were safe. The causes of the exclusions were as follows: "Diphtheria 5, contacts [illegible]. Scarlet fever 11, contacts 11. Measles 7, contacts 14. Chickenpox 52, contacts 17. Whooping cough 1, contacts 2. Mumps 12, contacts 3. Tuberculosis 3. Tonsilitis 104. Pediculosis 46. Faves 2. Scabies 15. Impetigo 69. Ringworm 17. Conjunctivitis 8."

A very large number of children have conatgious diseases in a very typical way. A great many diphtheritic throats have no membrane and some are never sore. On the other hand, a great many membranous throats are caused by bacteria other than the diphtheria bacillus. I have in mind an epidemic of scarlet fever in which a fair percentage of the cases had no rash at all. A week ago I saw four children with scarlet fever with little fever and no rash. Yet each of them caused secondary cases of typical scarlet fever.

Error to Close Schools.

While schools cause many cases of unsuspected contagion to be discovered, they offer opportunity for unfound cases to do much spreading. Even with a good school inspection, the amount of infection greatly increases when the schools open in the autumn.

Health authorities are not infrequently tempted to close the schools in times of contagion. This is usually a mistake except with measles, it being better to keep the children under observation in a school than to turn them loose for the uncontrolled meetings on the streets. Measles constitutes an exception. This disease is so communicable—so catching in its early stages that every now and then it is good judgment to close a school to prevent the development of measles. It may be of interest to note the total deaths in Chicago in 1907 from some of these diseases—a large part of the measles and whooping-cough deaths are reported as due to pneumonia and bronchitis—without these the figures were: Diphtheria 536, scarlet fever 715, measles 258, whooping-cough 259, typhoid fever 376.

Few towns or villages in this country had lower death rates in proportion to population. We find these figures trifling when we compare them with pneumonia 4,984, tuberculosis 4,030, and bronchitis 674, or a total of 9,688.

Further Development of School Inspection.

A development of the medical school inspection which is due to follow rather promptly is a systematic examination by culture of the throats of all school children for diphtheria bacilli. In certain children's homes in which diphtheria has been present the bacilli have been found in the throats of five per cent. of the well children. In certain other homes in which there had been no diphtheria chemically recognizable as such, active bacilli have been found present in about one per cent. of the throats of well children. It would be practical to examine the throat of every school child by culture early in the school year.

The School Nurse.

The function of the nurse is decidedly complex. As has already been indicated, she is a scout for contagion. In addition to the function previously noted, she gives follow-up features. When children are absent from school she goes to the homes to learn why. She finds cases of unreported contagion in the homes and also badly kept quarantines.

In addition she treats a great many mildly communicable conditions which persisting could not be allowed to remain in school. For example, pediculosis is not a grave condition, yet it is obnoxious to most of the patrons of schools. The parents who allow their children to contract lice are not very much concerned about lice. Many of them are willing to have their children excluded from school on any pretext. Whatever the parent may think, exclusion is scarcely fair to the child. The nurse comes into the field in this emergency—one or more simple treatments, the condition is relieved and the child no longer objectionable to its associates remains in school.

As a part of the follow-up system she goes to the homes and teaches the parents how to care for the children in many simple ways not possible to enter into here. An idea of the nurse's work can be gained from a study of their report for the week ending December 12, 1908. "The school nurses (of Chicago) visited 370 schools and 1,619 homes, seeing 1,943 school children. They referred 524 pupils to the school medical inspectors for diagnosis, sent 105 to dispensaries, 25 to hospitals, 216 to family physicians, 33 to visiting nurses' associations, 2 to Bureau of Charities, 10 to Relief and Aid Society, 13 to county agent. The nurses gave instruction to 1,879, and under the directions of physicians administered treatments to 510. The conditions treated were as follows: Pediculosis 116, impetigo 145, ringworm 32, eyes 22, scabies 13, faves 6. The reports of the medical school inspectors and the nurses are made out in triplicate, one copy goes to the health department, one to the school principal and one to the parent of the child.

Inspection for Non-Communicable Diseases.

The next development of the school inspection system is to include physical examination of the children for conditions which are not communicable.

This inspection is a scouting provision only indirectly curative. The examinations are all superficial. Each child is examined once a year. The average total time given an examination is twelve minutes, and this is about equally divided between making the examination and making the record. About eighty per cent. of the children examined are found to have bad teeth and about fifty per cent. have some physical condition requiring attention aside from defects in the teeth. The defects most frequently found are adenoids, enlarged tonsils, ear and eye troubles and poor physical development.

This kind of school inspection is based upon another principle of society government as well as another medical principle. The child is passing through its formative period. Trivial causes operating to produce minor immediate defects may be of great consequence in the later happenings of life. A twig may be bent. This does not make much difference to the twig, but when the twig has grown to a tree that bending will mar it beyond any possibility of usefulness. . . . .

Enlarged tonsils lead to a badly shaped face. A narrow chest to a bad mental development, bad citizenship. It has been found that most consumptives have narrow, deep chests. The adolescent or child-shaped chest. The man is doomed whose chest development has been slow during childhood or has been arrested during adolescence and has an increased chance of getting consumption.

A Public Concern.

Twenty per cent. of Chicago consumptives die at Dunning. Far more than half of them are community charges or family charges or lodge charges before they die. A child then which has an undeveloped chest or has neglected adenoids is a potential community liability. The community principle involved is that the rights of the community in a child in so far as a proper physical chance is concerned are superior to the rights of the parent. This development of the police power seems great, yet it has been surpassed in other and no more important directions. For example, compulsory education. A father says, "This is my child—I want that child to be happy. I have carefully studied the situation and I have concluded that uneducated people are happier than educated. I will therefore raise my child without education." But the law says, "The consensus of opinion does not agree with you. You have no right to force your child to accept the mental vagaries of the minority. Besides, experience has proven that a large percentage of those who become community charges or community menaces are uneducated. The community must be protected. We force you to allow the education of that child." Physical, mental and moral defects are all interwoven. A Solomon cannot untangle them. The law is just beginning to know that a child with a hatchet chest is as much a community menace as an uneducated child. Police power always follows in the wake of its need. A man lives without neighbors, miles of sunshine and air surround him—nature consumes his waste and peace reigns. Four hundred men live on an acre. Each poisons the other. The police power of nature, ample sunshine, air space and isolation are gone. In their stead must come man-made police power or else disaster stalks abroad.

So far physical examination is only to locate defects. These are reported in triplicate. One copy goes to the principal of the school, one to the parent and one to the health department. The report suggests what shall be done to remedy the defects. Usually these suggestions are not immediately accepted. A part of the duty of the nurse is to use her influence to see that the suggestions are accepted. Some day, of course, the parent will be forced to do what is necessary or else the community will do it. The selfishness of the average parent is amazing. For example, the father has completed his growth and ninety times out of a hundred is overfed. The child plays harder than the parent works. He is growing and requires food. He is not obese. They go to the table: Who gets the choice cuts of meat? Who gets the large piece? Who goes to bed hungry? Ninety-nine per cent. of parents who will not allow their children to be vaccinated carry fine scars themselves. I have never seen a parent rabidly opposing vaccination of his children who had not been vaccinated himself.

The community is interested in having men of good chest development. Backs that are straight, legs that are sound. The community menaces and the community charges are amongst the others. It is not going to be difficult to get warrant in law and financial backing enough to properly examine and properly control all school children who can be shown beyond reasonable doubt to be potential community liabilities.

The Adult Problem More Difficult.

A more difficult problem will be the adults. They are less amenable. Let us take the two diseases which are of overshadowing interest—pneumonia and consumption. The factors in pneumonia are excesses, exposures and carriers. The obese man is very susceptible. Can we prevent men from becoming obese to the point of uselessness and danger? I have heard obese men abuse drunkards for their lack of control and wisdom. Have they the right to throw stones? The man who gets drunk or is a sot in eating, how shall we control these? Both sick and well men harbor pneumococci and tuberculosis bacilli in their mouths. Can we control these, or can we even force men to keep out of badly ventilated places in which congregate men harboring pneumococci?

We hear much of the need for better housing, of the relation of drink to consumption, of the relation of poverty to consumption. All of these are important, but the most important thing is the man who has consumption. We will meet the consumption problem when we adequately care for him. Until then we will progress but slowly.

As throwing a sidelight on this subject I make this suggestion. We have been watching consumptives as spreaders more than we have food as spreaders.

In Chicago pulmonary tuberculosis is receding a little. There have been 124 fewer deaths from this cause in the first eleven months of 1908 than in the same period of 1907. But year by year the deaths from food tuberculosis get higher. The figure for the first eleven months of 1908 is 552 as compared with 520 for 1907.

Preventable disease can be prevented;

men can develop better, stronger, more capable, more resistent, saner and sounder; but the price must be paid. The price is more self-control—more community control. Something for nothing is a fantasy.

In the third paragraph from the last of the foregoing article Dr. Evans says, "We have been watching consumptives as spreaders more than we have food as spreaders." In the paragraph second to the last he says, "But year by year the deaths from food tuberculosis get higher." To the lay mind the inference is justifiable, from what the doctor says farther back in the article relative to overeating, that this habit helped to cause consumption or tuberculosis, To be clear on this point the Editor wrote Dr. Evans and received from him the following explanation:

"Replying to the second paragraph of your letter, I referred to tuberculosis contracted from eating food containing tubercle bacilli, and I had in mind particularly tubercular milk.

"Cooking kills tubercle bacilli, and any raw food is liable to spread the disease. The only food eaten raw that is of consequence from this standpoint is milk."

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*Thrilling Experiences of a Traveling Fireman—Stove Pipe Committee Resumes Its Sessions.**

Business was slow and times unusually quiet, and being (Columbus like) seized with an irresistible desire to see a little of the country, I procured a leave of absence and a little grub stake, donned a thousand-mile shirt, packed a small telescope keister with a few socks, handkerchiefs and an extra suit of underwear and started for the sunny south with the appearance of a cross between a stew bum and a stranded tragedian.

I didn't know where I was going, but I was on my way, and I stayed on my way until I got clear out of the way down in old Mexico, not broke but badly bent, so I took a job of firing and stayed just long enough to get a hobo stake and then blowed; yes I bunched it. I didn't stay to get on steady, and soon found out that a feller can't live on sunshine, sage and scenery. So I hit the ball on a ten-wheel hog, and being troubled somewhat with the shorts financially was compelled to rent a cheap room, which I found with a greaser embry not far from the roundhouse. The landlord was a kind hearted old gaffer and treated me with all the courtesy his native raising afforded. He showed me to a dingy little old ground floor room in one corner of the doby hut, an edifice without either doors or windows, just holes in the wall. But I made the best of it and went to bed with a head full of air castles and a longing in my heart for the old familiar scenes back in God's country that I had left not long since.

I was very tired and full of excitement and soon dropped off into dreamland, but was awakened about midnight by a strange sound which I found afterwards to be a half grown billy goat eating the buttons off my coat. Well, the way I put the kibosh on that animal wasn't slow. Then everything went well for a couple of hours longer when I awoke and found the room full of burros eating the straw tick out from under me, and then business picked up again. They all scampered out but one, and he and I went to the mat. Well, talk about your talkabouts, your "waltz me around again, Willies," and so on, they couldn't carry signals for me and that lop-eared mule. We gave an exhibition that would make moving picture shows a drug on the market. The excitement lasted some five or ten minutes, and then all was quiet until I was awakened by the morning sun shining in my face through the perforated roof that some high-wheeled Mexican had punched out while under the influence of muskall or cactus juice whisky.

After taking an inventory of the ceiling apertures I turned over to stretch a little and found on one side a gila monster trying to get acquainted with a centipede on the other, and a horned toad making googoo eyes over the dashboard of the bed, and say, if that didn't make little graveyards run up and down my back to exceed any speed limit in modern railroad history I miss my guess. I swore then that I would cut off behind the first guy that ever mentioned Mexico to me again. I had business uptown about that time, so I grabbed my wardrobe, that is, what was left of it, and hurried out behind the house to dress. On my way out I cornered a burro, sideswiped a billy goat and barked my shin on a pile of surplus mud bricks stacked up near the corner of the domicile. On the way uptown I met a Yaqui Indian wearing my fancy socks for a necktie and my silk suspenders to lace up his high-topped shoes, but I guess that is some of the things that a feller's got to get used to in that country, but I never went back to the mud house to sleep any more.

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*By L. I. Newton, Council Bluffs, Iowa.

I met an S. U. boomer on the street that day and told him the trouble that I had had in trying to master the untrained wild animal show that I had so hospitably shared my sleeping apartments with that night. He asked me if I drank any Mexican whisky before going to bed. I told him that I had not, and that was only half of it, I didn't intend to, and he said, "Then it's no wonder you didn't sleep well." Then he took me over to a hotel and stood good for my room rent and I was given a small room on the top floor where I had nothing to disturb my slumbers with the exception of a stray bat or two flying into my face during the night, but that was easy; my new home was a palace compared with the mud shanty and its friendly midnight callers. Before going to bed that night the landlord informed me that the occupant of the adjoining room was suffering from a severe attack of nervous prostration and asked as a special favor of me to enter and depart from my room as quietly as possible. I assured him that he needn't feel the least bit uneasy about me disturbing the geeser with the unlaced nerves, so I went up to bed that night full of hope and new admiration and forgot all about the nervous man next door, and when undressing let one of my shoes fall heavy to the floor. I then remembered my promise to the landlord and set the other one down in absolute silence and went to bed quietly, but was awakened along in the night by a rap on the door. I responded quickly, thinking that it was the call boy, but was greeted by the inmate of the adjoining room. He said, "I wish that you would please drop that other shoe so I can go to sleep," and then it was up to me to apologize to the nervous guy, so I handed him a bunch of dope selected from the written rules of modern railroad slang, when he went away with a smile on him like a catfish going up stream.

The next day I got acquainted with the landlord's daughter. She wasn't a bad looking dream but differed somewhat in general appearance from the girls of the United States. She had large, dark, dreamy eyes, palm leaf ears, trilby feet and a stature lofty enough to travel in high society. She waited on the table, and the boarders generally had to wait on her, which was responsible for my having to "pass" an occasional meal when running on short time.

The nervous man was in love with the waiter girl, and every time he saw me talking to her he would stalk in and mooch me for a chew of tobacco.

I kept my miles figured up pretty close, and just as soon as I got it made I dragged my time and beat it. Yes, I hit for the states and wasn't long getting there either.

I got arrested in El Paso and was charged with using profane language on the street, but when I explained to the mayor that I was only trying to pronounce some of those Mexican names he let me go and I sailed for Iowa on the first train that I found headed in that direction, and I found the weather fine and dandy when I reached here, so we got the stovepipe committee together at the roundhouse and had a fine, large meeting. You see, we couldn't afford to buy side curtains for the old oak tree, so we had to move into the smoke shanty when winter came on.

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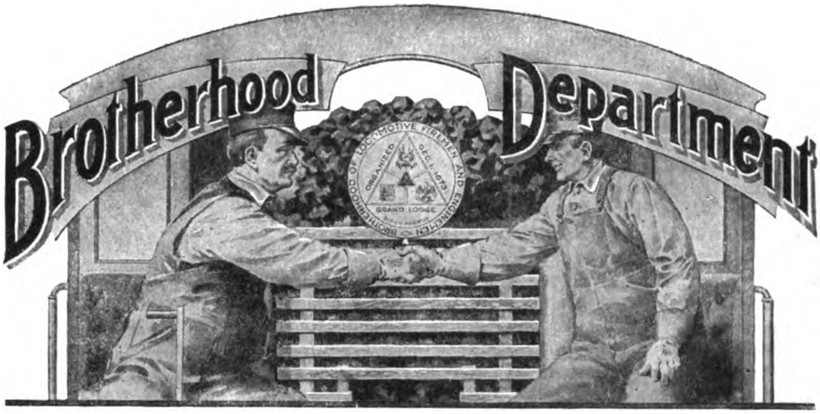

WE MUST "STRENGTHEN OUR DEFENSES"

Our members cannot attach too much importance to the words of the international President appearing in his Department in this month's issue, in which he urges complete and thorough organization. While it is true that our Order has materially increased in numbers during the past ten years, it is certainly an undeniable fact that if all belonged to the Brotherhood of Locomotive Firemen and Enginemen who by every sense of right and justice ought to hold membership therein, our numbers would today be vastly in excess of what they are.

Brotherhood Man Pays Non-Brotherhood Man's Protection.

As a consequence thousands of firemen who have been reaping the benefits of the work of the Brotherhood without in any way contributing either to the effort or the expense of conducting that work, would be members thereof and as such would be each one bearing a just proportion of the cost of his own protection. Thousands of such men have been for years enjoying the advantages of increased wages and freedom from the performance of some very disagreeable duties heretofore identified with the calling of the locomotive fireman, at absolutely no cost to themselves and entirely at the expense of Brotherhood men.

Indifference of Our Own Men Largely Responsible.

This condition of affairs is to say the least unjust. We are compelled to admit, however, that it is attributable for the most part to the indifference of our own members, for in the case of a majority of the firemen who are today outside our ranks, it is only necessary to urge the advisability of joining the Brotherhood and to give them an application to fill out in order to secure their membership.

In Time of Peace Prepare for War.

President Carter speaks none too soon and none too forcibly when he says that the time has come to strengthen our defenses. A general reduction in wages is one of the leading numbers of the panic program and recent developments and present indications justify the conviction that the "interests" responsible for the formulation of that program have by no means abandoned the hope of carrying that particular feature of it to a victorious conclusion.

Roosevelt's Intervention.

Already the fight is on and in some instances the attempt to reduce wages has been successful, particularly in the field of the iron and steel industry, which industry is extensively recognized as the barometer of general business conditions. In other fields it is being resisted by organized wage-earners in a life and death struggle. It is a matter of but recent history that ex-President Roosevelt intervened and intervened vigorously and successfully to avert a proposed general reduction of railroad employes' wages before same had become so far effective as to involve the railroad Brotherhoods in a fight in their own defense. Just how soon another such attempt will be made it is difficult to say, but it stands us very much in hand to be prepared to meet it,

No Exaggeration.

President Carter's statement to the effect that there are lodges in our organization that represent hardly a majority of the locomotive firemen under their respective jurisdictions is in no sense an exaggeration of the real conditions. The existence of this state of affairs, as he very truly says, invites trouble and it is, therefore, decidedly to the interests of our own members to see to it that every non-Brotherhood fireman they can influence joins our Order at the earliest possible moment. If our men generally will do this there is no question as to the result. Each member should regard it as a duty he owes himself as well as the Brotherhood, to devote his very best effort in helping to close up the ranks of the Order and to do his full share in the work of organizing non-Brotherhood firemen.

Thorough Organization Essential.

Each lodge and each Protective Board should see to it that every non-Brotherhood fireman within their jurisdiction becomes a member of the Brotherhood of Locomotive Firemen and Enginemen within the shortest possible space of time. Regardless of what the plans of the captains of industry and princes of finance may be, one thing is reasonably certain, and that is that no railroad company will undertake to reduce the wages of its employes if its management realizes that those employes are solidly organized, and no men are more thoroughly informed as to the exact condition of organization amongst railroad wage-earners than are railroad officials. With those gentlemen it is purely a matter of profit and loss, and before considering participation in a general wage-reduction movement the officials of each system will carefully figure out whether, as a result of their taking part in such movement their particular company is likely to make money or lose money.

How to Avert Conflict.

If they conclude that their men are so well organized that the fight resulting from an attempted reduction in wages will cause the company to lose more money than they would expend by continuing uninterruptedly the present rate of wages, they will not attempt a reduction. If, on the other hand, they find that the labor organizations on their lines are so weak that they could not make an effective resistance they will consider it to their advantage, from a profit viewpoint, to cut wages and will undertake to do so, and such attempt, whether successful or not, will inevitably result in much loss and suffering to all concerned.

Present Rate of Wages Too Low.

It is not alone for the purpose of resisting a reduction in wages, however, that the men of our occupation should be solidly organized. Railroad men, and particularly locomotive men, are not, as a general proposition, receiving wages enough. It is feared that the tariff readjustment at present in the course of preparation will tend rather to increase than to lower the cost of living. Already rumors which have leaked from the Congressional Ways and Means Committee room at Washington would indicate an increase in the tariff rates of certain of the necessities of life, which is sure to encourage trusts and monopolies in increasing the cost of the commodities which they control which are not directly affected by the tariff.

Wages Not Proportionate to Cost of Living.

To live as Americans should live, even at the prevailing cost of life's necessities, we must have more money for our work. The business is in the country to create a better demand for labor and times are hard only because a few men—our modern plutocracy—that select judicially-fostered coterie which controls our present economic and financial systems, has seen fit to make them hard with a view to cheapening labor and crushing the masses into subjection.

Many Don't Realize.

As suggested by Bro. Carter, there are many non-Brotherhood firemen whose railroad experience is so limited that they do not realize and consequently do not appreciate all that our Order has done in the past to improve the positions they are filling, particularly in the matter of increased wages and the abolition of certain slavish duties, such as scouring brass, etc., imposed upon the firemen in years gone by. If this is made clear they will understand how necessary it is to maintain the Brotherhood up to a standard of complete organization, not only with a view to continuing these desirable conditions, but as well to securing future concessions and making the position of fireman, as well as that of engineer, what they ought to be from a standpoint of compensation and working conditions.

Each Man Should Become a Missionary.

It is to be hoped that every member of the Brotherhood will vigorously cooperate in the campaign which is being conducted under the direction of our worthy Assistant President, Bro. Wilson, and from which campaign, as the returns in the Magazine office show, most desirable results are already forthcoming. Bro. Carter truly says that the most successful missionaries in the work of organizing are those of our members who have a personal acquaintance with non-Brotherhood men, and we would add that the co-operation of such members is not only desirable but absolutely essential to the complete success of the present organizing campaign in which we are engaged.

If each individual member will do his part in this great campaign and will at once enter vigorously into the work, the Brotherhood of Locomotive Firemen and Enginemen will ere long be organized to such a complete standard as not only to place attempted wage reductions entirely out of the question, but to make a general increase an early possibility.

It is therefore to be hoped that, as Bro. Carter urges, steps will be taken to have the members in our respective lodges personally see and bring into the fold, where he properly belongs, each particular non-Brotherhood man with whom they have friendly relations. At the present time the most important duty of the Brotherhood as a body is to ORGANIZE.

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Accident Indemnity Department.

The special attention of our members is directed to the proposed rules and regulations of the Accident Indemnity Department which are published in full in this issue of the Magazine. The importance of the adoption or rejection of the proposition to establish such a department in connection with our Brotherhood cannot be over-estimated.

Our general Secretary and Treasurer advises that copies of these rules sufficient to supply each and every member have been forwarded to the recording secretaries of our subordinate lodges. Each member is, therefore, urged to apply to the recording secretary of his lodge for a copy of these proposed rules and regulations and to study same carefully before casting his vote for or against the proposition.

It is to be hoped that each member of our Order will vote on this very important question and that he will carefully read the proposed rules and regulations and give the subject mature study before casting his ballot.

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Canadian Grand Union Meeting.

Elsewhere in this issue appears an announcement of the Canadian Grand Union Meeting to be held at Winnipeg, Man., on August 3, 4, 5 and 6, 1909. The preparations already under way give positive assurance that it will be attended by the usual success characterizing Canadian Union Meetings, and will in all probability surpass in this particular any thus far held.

Our Canadian brothers by making their announcement at such an early date are giving ample opportunity for all members and their families to make the necessary plans to be in attendance.

Full advantage should be taken of the early notice thus given to make the Winnipeg Canadian Union Meeting the largest gathering of its kind thus far held in the history of our Order.

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Sparks.

The brother who secures the greatest number of new members is the one who believes that no better fraternity exists than the B. of L. F. and E. Being filled with enthusiasm himself, it is an easy matter for him to impart it to others. It is this brother who will help us to go to our St. Paul Convention 90,000 strong.

Judging from the orders we are receiving, our little chart of the new No. 6 ET Locomotive Brake Equipment is proving very popular with our men. Fifteen cents is all it costs, together with printed descriptive matter. Send your remittance to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Immediately upon changing your residence notify this office, so that you will not miss any numbers of the Magazine, for the very copies you miss may contain articles of special interest and value to you. Besides, it is a wise plan to keep your file complete.

Elsewhere in this issue appears an announcement of the Canadian Grand Union Meeting to be held at Winnipeg, Man., on August 3, 4, 5 and 6, 1909. The preparations already under way by our Canadian brothers in charge of the arrangements of this great Brotherhood event give positive assurance that it will be attended by the usual success characterizing the Canadian Union Meetings, and will in all probability surpass any thus far held. Our Canadian brothers by making their announcement at such an early date are giving ample opportunity for all who desire to be in attendance to make the necessary plans.

As has been stated repeatedly in the Magazine, we cannot give attention to anonymous communications. The writer must sign his name, and if he so desires the authorship will be guarded as confidential, but we must have his name in order to know that the letter was written in good faith.

By remitting 50 cents to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind., you can procure a copy of the Catechism of the Electric Headlight. This little book is an authority on the headlight and will prove invaluable to every up-to-date railroad man,

Make up your mind to be an active missionary in the work of procuring that 90,000 for our St. Paul Convention. It is your duty just as much as the other brother's, and if each one of us will put our "shoulder to the wheel," its revolutions will surely count.

Brother J. R. Sowell writes the Magazine office that Lodge 492 is prospering and their goat is doing fine work.

Bound volumes of the Magazine for 1908 are now ready. These volumes contain a mine of information on such subjects as the Walschaert locomotive valve gear, the No. 6 ET locomotive brake equipment, locomotive running and repairs, the Westinghouse air brake, train rules and train practice, etc. A copy will be sent prepaid anywhere within the United States, Canada or Mexico, upon receipt of $2.50. All orders should be addressed to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

If there are any non-Brotherhood firemen on your road remember they are enjoying the advantages gained by the Brotherhood without contributing anything to the cost of maintaining those advantages, and you are bearing the burden of their protection. Give them application blanks and invite them to join the old "Tried and True." The insurance feature alone should be a great incentive for any man to join our Order who realizes the necessity of providing for his loved ones in case of disability or death. When, however, all the other advantages of membership in our Brotherhood are considered, no fireman can in justice to himself afford to be outside its ranks.

Full advantage should be taken of the early announcement given of the next Grand Union Meeting to be held by our Canadian brothers in Winnipeg, Man., on August 3, 4, 5 and 6, 1909. It is hoped to make this event the largest gathering of its kind which has heretofore been held.

We still have left a few bound volumes of the Magazine for 1907. One of these in connection with the bound volume for 1908 will form a most valuable addition to the technical library of any ambitious locomotive fireman or engineman. If you wish to secure one or both of these volumes you should avail yourself of the opportunity while the supply lasts. Price $2.50 each, prepaid to any address within the United States, Canada or Mexico, Address all orders to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Every member should co-operate in the organizing campaign being conducted by our worthy Assistant President, Bro. Wilson. If you are acquainted with a locomotive fireman who is not a member of our Brotherhood, use your influence with a view to have him join at once, and if you know of any such men and are not acquainted with them, get acquainted and through your own influence or some one else's have them become Brotherhood men.

PROPOSED RULES AND REGULATIONS OF ACCIDENT INDEMNITY DEPARTMENT OF THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN AS PREPARED BY THE BOARD OF DIRECTORS

Accident Indemnity Department.

Section 1. The Grand Lodge shall establish a Department to be known as the Accident Indemnity Department of the Brotherhood of Locomotive Firemen and Enginemen, for the purpose of providing relief for members who may become disabled through accident, which Department shall be self-sustaining, and in which all members may participate up to the age of seventy years, excepting those who are mentally unsound, subject to fits, of defective hearing or eyesight, intemperate or disreputable, or whose time has no money value.

Sec. 2. Each applicant shall fill out and sign a prescribed form of application, subscribed to by any member in good standing, which shall be accompanied by an application fee of Two Dollars ($2.00) and the amount of the first assessment, same to be received and read at one meeting of any lodge, and referred to the Financial Secretary, who shall sign and forward to the General Secretary and Treasurer. Such application shall contain certain provisions as to physical conditions, habits, age, occupation, name of beneficiary or beneficiaries, place of residence, and such other facts as may be prescribed. All of such statements shall be warranted by the applicant to be true and correct in every particular. If the statements and warranties are accepted by the Department, a certificate of membership shall be issued to the applicant, who shall then become a member of this Department, and be entitled to indemnity under his certificate, only upon compliance with the conditions herein contained. In the event of an application being rejected, all monies collected shall be returned to the applicant. No examination of applicant by a physician shall be required when making application for membership or when renewing certificate.

Sec. 3. All members participating in this Department shall be governed by the provisions of these rules and regulations, together with that contained in the application for membership and certificate issued, and all applications, certificates, rules and regulations shall be governed by, subjected to and construed according to the laws of the State of Illinois. No changes or alterations shall be made in any of the sections of the law pertaining to the Accident Department except upon a petition signed by twenty-five members, who are then carrying Benefit Certificates in this Department; such petition shall then be submitted to the Board of Directors, who shall have the authority to make the proposed change in the law, if, in their judgment, it is deemed advisable for the best interest of this Department: Provided, If it is found that any of the laws herein embodied shall operate to the detriment of this Department or the Brotherhood in general, the President, General Secretary and Treasurer and Board of Directors shall have authority to make necessary changes without such petition. (This Department being experimental, it is considered advisable to make provision for such changes as may be found necessary in the interest of the members participating and the Organization at large.)

Sec. 4. Benefits in this Department shall be in effect only for the time for which assessments have been paid. Members who have become delinquent by reason of non-payment of assessments, may be readmitted by making application on the prescribed form, and the payment of fifty cents to pay the cost of issuing new certificate, provided they are free from injury and application is made within ninety days from date of delinquency. Delinquent members making application after ninety days will be admitted only as new members.

Repeated and excessive claims made by any member shall be sufficient cause for the Department to decline to accept further assessments, or be liable for further payments of benefits, and in no case shall benefits which are provided for by this Department cover disability resulting from injury received prior to date of membership or from deliberate exposure to accident upon positive proof of same.

Sec. 5. All claims made against this Department for any principal sum, or notice of claims for weekly indemnity, shall be made within twenty days from date of death or accident, such notice and proof of death or disability shall be mailed in the prescribed form, through the office of the Financial Secretary of his lodge, or in the event of being away from his home lodge, through the office of the Financial Secretary of the lodge nearest his place of residence or point where the accident occurred, to the General Secretary and Treasurer. The General Secretary and Treasurer, upon receipt of such notice and satisfactory proof, shall mail to the claimant, or in case of death, to his beneficiary, the amount of such claim to the address given in the application, provided that no indemnity shall be allowed on any disability claim unless such disability extends for a period of seven days; but in the event of a member becoming disabled for more than seven days, then indemnity will be paid from date of disability. No liability shall be incurred by this Department on account of death resulting from accident unless such death occurs within ninety days from date of injury. Any untrue statement, willful misrepresentation, or suppression of facts made by any member for the purpose of defrauding this Department, shall operate as a forfeiture of all claims against this Department, and in such cases the member shall not be entitled to have any part of the money paid into this Department refunded. Blank forms of proof of death and disability shall be furnished financial secretaries of subordinate lodges, which shall provide for the sworn statements of the President and Financial Secretary, also that of the coroner or attending physicians, as to the correctness of the statements furnished. The member shall at all times during the continuation of such disability be subject to an examination by a physician or physicians employed by the General Secretary and Treasurer to examine him.

Sec. 6. Each member of this Department who, while his certificate is in effect, shall receive bodily injury sustained solely through violence, or accidental means, (provided, that no benefits shall be paid for disabilities arising from disease) which shall fully disable said member, independent of any other cause, so as to produce a total loss of time and prevent him during such disability from performing any and every kind of labor or business, shall, subject to the provisions of these rules and regulations, application and certificate of membership, receive such a sum as indemnity for each week that he is disabled as shall be computed according to the classification of risks and rates herein provided, but in no case shall such indemnity exceed three-fourths of the average weekly income of the insured at the time of making application for membership or renewal; provided: in no case shall the period of total disability for which this Department is liable exceed fifty-two consecutive weeks; provided, further: in case of death from injury all weekly indemnity paid because of such injury will be deducted from the principal sum provided for in the certificate of membership. Accident benefits by this Department shall in no case extend to and cover disappearance, nor to medical nor surgical treatment necessitated by injury unless such medical or surgical treatment is instituted within thirty days of the occurrence of such injury, nor to injury received while intoxicated, nor caused by the use of narcotics, poison, inhalation of gas, fighting, wrestling, intentional injury inflicted upon the injured by himself or any other person (assault by burglar or highwayman excepted), nor to injury resulting from immorality, dissipation, rupture, vertigo, fits, racing, unnecessary lifting or exposure to unnecessary danger (the attempt to save human life excepted), nor to injuries received by war or the violation of the law of any State, Province or Corporation, nor to suicide, whether sane or insane. No indemnity in whole or in part, or death benefit will be paid until a full and complete release, releasing this Department from further liability on account of disability or death, has been duly executed.

Sec. 7. Renewal of Certificates shall be made yearly upon application, by the issuing of renewal form of receipt by the General Secretary and Treasurer upon the receipt of required fee and assessment; and no alterations of the terms of any application or certificate shall be made valid, and no forfeiture thereunder shall be waived, unless such alterations or waiver shall be approved and signed by the President or Assistant President and countersigned by the General Secretary and Treasurer.

Sec. 8. There shall be established and maintained an Accident Indemnity Fund for the purpose of paying such losses as are sustained by this Department; into this Fund shall be paid all application fees, assessments, renewals and special assessments. The Fund thus created shall be held in custody by the General Secretary and Treasurer, and shall be used for no other purpose than that for which it was created.

Participation in this Department being optional, no lodge shall be permitted to use any funds of the lodge for the purpose of paying fees or assessments to the Accident Indemnity Department for any member who may participate therein. The President and General Secretary and Treasurer shall have authority to levy special assessments to meet any emergency that may arise in this Department regarding the payment of death or accident claims,

Sec. 9. The Financial Secretary of each subordinate lodge of the Brotherhood of Locomotive Firemen and Enginemen shall be authorized to collect application and renewal fees, or assessments, same to be forwarded by him to the General Secretary and Treasurer on or before the 20th day of each month. The expense of this Department shall be paid from its revenues, not to exceed 3 per cent. of all monies so collected. The Financial Secretaries of subordinate lodges shall receive fifty cents of all application fees and twenty-five cents of renewals, and 3 per cent. of all assessments collected by them, same to be deducted by the General Secretary and Treasurer and returned to the Financial Secretary.

Sec. 10. A member may select and designate as his beneficiary or beneficiaries any one or more of the persons named in the following class, viz: (a) Wife, (b) child or children, (c) mother, (d) father, (e) brothers and sisters, (f) blood relations and dependent ones. In case the beneficiary is under age, the funds may be placed in the hands of a guardian for the immediate benefit of the beneficiary if necessary, but in case there is a failure of designation of a proper and legal beneficiary, the amount of the certificate shall be paid to the above persons in the order named.

Sec. 11. The rates and condition of payment shall be as follows:

Principal Sum.	*Weekly Indemnity.*	*Yearly Assess'ts.*
$1,000	$ 5 00	$10 00
1,000	10 00	15 60
1,000	12 50	18 20
$1,000	$15 00	$22 00
1,000	17 50	28 80
1,000	20 00	26 60
2,000	10 00	20 00
2,000	12 50	22 80
2,000	15 00	26 60
2,000	17 50	28 20
2,000	20 00	31 00
	5 00	5 60
	10 00	11 00
	12 50	13 80
	15 00	17 60
	17 50	19 20
	20 00	22 00

Same to be paid in four equal assessments quarterly; the first assessment to accompany the application fee, and one assessment each succeeding quarter, calculated from date of certificate. The failure to pay any assessment when due will cancel certificate and all benefits accruing therefrom.

Sec. 12. If the rates of assessment as above named are found to be insufficient or in excess of the requirements, the President, General Secretary and Treasurer and Board of Directors shall have authority to make such changes as in their judgment are deemed advisable.

APPLICATION FOR MEMBERSHIP
ACCIDENT INDEMNITY DEPARTMENT
Of the
BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

Schedule of Statements, Warranties and Agreements.

I, ..., hereby apply for a certificate of membership in the Accident Indemnity Department of the Brotherhood of Locomotive Firemen and Enginemen in the Principal Sum of $........ Weekly Indemnity $........, to be based upon the following statement of facts, all of which I hereby warrant to be complete and true in every particular, and I agree if any of said statements shall be untrue in any respect, the certificate shall be null and void.

1. My full name is .... (Do not use initials.)
2. I am a member of.......Lodge No..
3, My age at next birthday is....years; (a) weight....... lbs.; (b) height ....feet, ...inches.

4. My residence and Postoffice address is ....City of ....State or Province of................

5. My present occupation is that of .... Employed on.......... Division of.............Railway... ....
(If not in railway service, state occupation here.)

6. My income per week is $........... and exceeds the gross amount of weekly or monthly indemnity under all certificates or policies carried by me.

7. If during the life of this certificate, I apply for other accident benefits, I agree to at once report the same to the General Secretary and Treasurer.

8. In case of death by accident, my beneficiary shall be................
(Full Name)
whose relationship is that of........ .... and whose address is ....

9. I have never participated in this Department except under Certificate No. ...., which lapsed about ....

10. I am not carrying a certificate or policy in any other Company, Association or Society, paying accident benefits except as herein stated.
(The name of Company, Association or Society and amount carried in each must be stated.)
....
....
....

11. No application ever made by me for insurance of any kind has been declined, or any such certificate or policy of insurance cancelled, or renewal declined by any Company, Association or Society except as herein stated.
(State fully if any of the above have taken place.)
....
....
....

12. (a) My habits of life are correct and temperate; (b) I have never been ruptured or otherwise injured, or suffered the loss of a limb or the sight of either eye; (c) My hearing or vision are not impaired; (d) I have not had any medical or surgical treatment during the past five years except as herein stated.
....
....
....

13. I am not subject to, do not now have, nor have I ever had fits of any kind, vertigo, hernia, nor any disease or infirmity, mental, physical, nervous, venereal, chronic or inherited, except as herein stated.
(State here if you have ever been afflicted with any of the above.)
....
....
....

14. I have not been disabled by accident or sickness to exceed .... weeks in the aggregate, nor have I received more than $.......... as indemnity for the same during the past five years.

15. I understand and agree, (a) that the benefits shall not exceed three-fourths of the amount of my average weekly wages, or money value of my time; (b) I expressly waive, on behalf of myself or any other persons who shall have or claim any interest in any certificate issued hereunder, all provisions of law forbidding any physician, or other person who attended or examined me, or who may hereafter attend or examine me, from disclosing any knowledge or information which he thereby acquired.

16. I understand and agree, that the benefits are not effective until the certificate fee has been paid and the certificate has actually been issued by the General Secretary and Treasurer that this Department is not bound by any knowledge of, or statements made by, or to, any Financial Secretary unless written hereon. I FURTHER AGREE TO ACCEPT THE CERTIFICATE SUBJECT TO ALL ITS PROVISIONS, CONDITIONS AND LIMITATIONS, AND SUBJECT TO ANY CHANGES THAT MAY HEREAFTER BE MADE IN ACCORDANCE WITH THE LAWS GOVERNING THIS DEPARTMENT, AND PAY THE QUARTERLY ASSESSMENTS OF $............Dollars ($..........) IN ADVANCE WITHOUT NOTICE.

Dated at .... this day of .... A. D. 19..

....
(Signature of the Applicant.)

Witnessed by

....

FROM THE PRESIDENT

Organize.

A union worker once said that "when industrial conditions are at the height of prosperity the need of labor unions is not appreciated. It is only when the wage reduction period is reached that so many of the crafts find themselves without protection because of the lack of thorough organization."

For a period of ten years this Brotherhood found itself too busy in reaping the harvest of prosperity to bother itself to any great extent about seeking recruits. It is true that during that period the Brotherhood increased greatly in membership, but most of them were volunteers.

But now the time has come to strengthen our defenses, and the presence of nonunion men is an invitation to aggression in any trade.

There are lodges in this country that represent hardly a majority of the firemen under their respective jurisdictions, and the members of those lodges are inviting trouble when they permit such conditions to exist. Let every member get busy and personally solicit members wherever they are available. If you don't do it now you may wish after a while that you had.

If the nonunion man, because of his short time in railway service, doesn't know of the increases in wages and improvements in conditions that this Brotherhood has brought to all firemen on your road tell him about it. If your own experience is limited ask some "old timer," who cleaned his engine two to three hours every day without pay, who worked two to ten hours overtime without pay, and who fired engines for but little more than half of what your nonunion man is now getting.

It has become evident that Joint Protective Board work will take up practically all of the time of the five Vice-Presidents. In order that the nonunion man may not be entirely neglected the Assistant President has been requested to undertake a campaign of organizing work. For more than a month Brother Wilson was busy with a stenographer six days in the week, and has since undertaken a month's missionary tour through the eastern part of the country. Already the good results are noticeable.

It is hoped that some of the Vice-Presidents will soon be relieved from Joint Board work so as to thoroughly canvass railway systems for new members. The President will also get into the field, and will provide organizing literature which may help the cause along.

The most successful missionaries, however, are those members of the Brotherhood who have personal acquaintance with nonunion men. If you don't believe it, try the following experiment:

At your next lodge meeting appoint members to personally see each particular nonunion man. Use discretion by assigning members who have friendly relations with these nonunion men. A friend will seldom fail. At the next meeting of your lodge call for reports from those assigned to the work. If you fail the first time try again. Whatever you do, *organize!*

By-Laws of Subordinate Lodges.

Section 185 provides that "each lodge may pay weekly benefits to sick and disabled members, provided suitable by-laws governing the conducting and management of such a department are first adopted."

It may be implied from this that any lodge may devise its own form of "weekly benefit" so long as no features are included that are in conflict with the constitution of the Brotherhood.

Unfortunately for the good of the Brotherhood and its members, some well-meaning lodges have taken advantage of the privilege granted in Section 185 to create new codes of laws for their general government, some of which are in direct violation of the constitution,

It was never intended that the "suitable by-laws" referred to in Section 185 should relate to anything else than "weekly benefits to sick and disabled members." The "by-laws" of subordinate lodges are enacted by conventions of the Brotherhood and begin in the present constitution with Section 128. Subordinate lodges should not attempt to enact their own by-laws, for they have no authority in such matters.

From time to time lodges send in copies of by-laws they have adopted with the request that they be approved by the President. The President is not required to approve by-laws governing a sick benefit department of a lodge, and he has no authority to approve any other kind of by-laws.

The last convention fixed all fees and assessments payable by members of subordinate lodges as shown in Sections 80, 81, 164, 165, 166, 169, 216, etc. Notwithstanding these express provisions of our laws it appears that some lodges have attempted to create and levy "monthly dues" in an amount that will cover all of the assessments provided for in the constitution.

It should be understood that while such an arrangement may be acceptable to a majority of the members of a lodge, no member can be legally expelled for failing to pay any assessment not specifically provided for in the constitution or that has been levied by a convention of delegates.

Except where sick benefit departments are conducted, all lodges should be content to operate under the "by-laws" enacted for them by conventions, and which by-laws are plainly printed in the constitution. It is not necessary that a lodge adopt by-laws for fixing dates and places of holding meetings, recompense to officers, etc., for such matters as these can be fixed by vote of lodge and recorded in minutes of meetings.

The courts have held that a legislative body cannot delegate legislative authority, and these decisions have resulted from subordinate bodies attempting to expel members for noncompliance with laws that were not enacted by the law-making body of the association.

A Relic of By-Gone Days.

A few months ago Mr. Eugene V. Debs, many years an honored member of this Brotherhood, sent me a valuable memento of the past. Mr. Debs was a charter member of Lodge 16 and an active worker from the day of his initiation. About fifteen months after the institution of the Brotherhood he received the following letter from our First Grand Secretary and Treasurer:

"GALION, Ohio, March 17, 1875.

"*Eugene Debs, Esq.:*

"Dear Sir and Brother—Yours of the 14th before me, and I can now say I have two good correspondents in the State of Indiana—Bro. Wm. Huffman, R. S. of No. 8 at Seymour, and I will put you down the other. Now I must ask of you to always give me time and I will ever be on hand, but my engine requires so much of the time during my 14 hours lay-over at home that it often, with our Order, keeps me from my rest, so when you don't get an answer immediately, know that I am busy on my "pet," or, as the boys say, "pounding my ear," but always write me long letters, as I will be pleased to hear from you and No. 16 and give all advice I can to benefit you.

"You will experience at first some trouble from your members, viz., complaining of what so and so says and does, etc., but this you must brace up under, and by wearing the lessons taught in your rituals upon your mind your eyes will soon speak, and to a greater extent than the tongue can. Always remember the Order is a secret one, and by *jealously guarding* your every act outside of your lodge room you will find that *all* will show you respect. You will be *particular* and instruct your members that they must not communicate nor give out our signs or passwords. If a brother is in ignorance of any of these requirements he must go to the master, who will charge him. In balloting for a candidate charge the brothers well to weigh their thoughts upon the person's character and standing and to also vote that no one brother knows how the other votes. Personal matters should not keep a man out of the Order, and above all things *be careful whom you let in.* Your outer guard must stand *by his* position.

"Your dues should commence March 1st, and if your F. S. will introduce a motion which if seconded and carried will become one of your by-laws to this effect all brothers will pay their dues on the 1st or 2d regular meeting night in each month. It will save him and the lodge lots of time and trouble. When a brother cannot get there *he can send it.*

"2d. You will not have any Grand

Lodge dues to pay till after December, 1875, and that will be determined on at convention as to how much they will be. 'Tis used to buy books, papers, etc., to run the Order with. I won't have enough this year by $75.00 to $100.00.

"3rd. Your initiation fees all go into your treasury. *You don't pay the Grand Lodge any of it.* When a name is sent up for initiation it must be accompanied by $1.00; the night he is taken in he pays the other $4.00—all this goes into your treasury.

"Now, brother, I hope this much is plain; if not do not hesitate to write me. I am

Your servant and brother in this work,
(Signed) WILL N. SAYRE.

"P. S.—I forward you six books tonight. More in press will soon be out. Don't be afraid to jog my memory.
W. N. S."

Mr. Sayre is probably dead, and twenty-nine years have passed since he was with the Brotherhood, yet his advice about the "trouble makers" is not without value today, and when the "knocker" is abroad do not become discouraged, but "brace up," as Brother Sayre said in the old days. Help boost the good work along.

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FROM THE GENERAL SECRETARY AND TREASURER

Receipt Books.

The new official receipt books now being supplied to subordinate lodges were made up so as to relieve the financial secretary of as much work as possible. Owing to the fact that a resolution authorizing a punch form of receipt was not adopted by the last convention, it became necessary to prepare a receipt somewhat like the one in use prior to March 1, 1909. This receipt was made with "Lodge and No." together so as to permit the use of a rubber stamp, provided the financial secretaries desired to do this. Much writing could be dispensed with if a rubber stamp is used. A rubber stamp can also be used by the financial secretary to sign his name to receipts, and in fact I would rather encourage the use of rubber stamps on receipts.

This office can furnish two rubber stamps; one with the name and number of lodge; one with name of financial secretary, together with an ink pad, for fifty cents a set. The charge for these is just enough above the cost price to pay postage and packing.

Return Old Receipt Books and Traveling Cards.

To any lodge having on hand any full books of receipts or traveling cards that were in use prior to March 1st we will forward the same number of the new kind if they will return the old ones to this office. Do not send any but full books, *and if sent by express be sure and prepay the charges. Also be sure and place the number of lodge on the package containing such book. If you fail to do so, this office cannot guarantee exchange for old books.*

Remitting for Supplies.

Section 199 of the constitution provides that treasurers shall not remit for supplies when making other remittances. Many treasurers continue to remit for supplies when remitting beneficiary and general fund assessments. This should be discontinued, as it makes it necessary for this office to have draft or money order cashed in order to separate the money and get it in the proper funds.

I urge upon treasurers to kindly make remittances for supplies entirely separate from any other remittance.

We are perfectly willing to do everything within our power to relieve the treasurer or any of the officers in any way we can, but remitting for supplies as indicated above makes a great increase in the work of this office.

General, Not Grand.

Some treasurers continue to remit to the *Grand* instead of the *General* Secretary and Treasurer. As all drafts have to be endorsed by the *General* Secretary and Treasurer (as accounts are carried in that way), it makes it necessary to place two indorsements on all drafts, etc., deposited in the bank. I call this to your attention and request that in the future you make all drafts, etc., read *General* Secretary and Treasurer.

Time in Which to Pay Joint Protective Board Assessments.

This office has always tried to give as early notice as possible when levying Joint Protective Board assessments. Cases are coming up where we receive notice on any day prior to the 15th of the month, and in some cases later, of assessments to be paid not later than the first day of the following month, This does not give time in which to notify the recording secretary of the assessment and he in turn notify the financial secretary to collect the same. The amount of this assessment must be forwarded so as to reach the Grand Lodge office not later than the 20th of the following month. It will readily be seen that this works an injustice on the members as well as the local lodge officers, for many members are expelled for failure to pay these assessments, and lodges are suspended for failure to have the money in the Grand Lodge at the time it is due. This office should have notice of Joint Protective Board assessments so that the lodges could be advised of the same at least thirty days prior to the last day of payment. It would be better for them to have a longer time, and I urge upon the officers of the Joint Protective Boards to advise this office as far in advance as possible of the date they are going to make an assessment payable. When a short time is given and lodges fail to have their returns in this office on time there is nothing for us to do but follow the law, even though we think an injustice may be done to members of lodges.

Expense of Notifying Members When Their Lodge is Suspended.

The matter of expense in sending notices to members when their lodge has been suspended has become very heavy. Your attention is called to this from the fact that on March 1st there were lodges suspended whose aggregate membership amounted to 6,900. You can readily see what this means in the way of postage. Enough stamped envelopes have to be sent to the Magazine office to cover this number so they can be addressed, as the General Secretary and Treasurer's office is not equipped with a file of the addresses of individual members. When these envelopes are returned, notices have to be folded, placed in envelopes and mailed. We cannot have the envelopes addressed until after the first of the month; and many times before we can send out the notices the returns have been received relieving the lodge from suspension. I desire to urge upon the president and recording secretary of every lodge when they receive notice from this office that the treasurer has failed to make his returns by the 20th of the month, that they would at once see that the money is forwarded so as to reach the Grand Lodge office at the earliest possible moment and before the first of the month. If this is done it will prevent the lodge from being suspended, the members from being notified and the expense of such notification will thus be saved.

Transfer of Members.

Particular attention should be paid to the transferring of members. Recording and financial secretaries must not consider a member transferred from or to their lodge until official notice is received from this office of the actual date on which the transfer will be made and when such member will begin to pay assessments into the lodge to which he has been transferred.

Accident Indemnity Department.

There appears elsewhere in this issue of the Magazine the proposed rules and regulations for the Accident Indemnity Department. There has been forwarded to the recording secretary of every lodge enough copies of these rules and regulations to supply each member with a copy. The last page is the ballot on which members will vote for or against the creation of this department. *These ballots must be in the Grand Lodge office by June 1st at the latest. No ballot received after that time will be counted, and none but the official ballot above referred to will be accepted.*

Funeral Expense Fund for Non-Beneficiary Members.

There has been mailed to the addresses of all nonbeneficiary members whose names appear on the Grand Lodge register a notice of which the following is a copy:

BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

PEORIA, ILLINOIS, March 1, 1909.

To all Members Holding a Non-Beneficiary Certificate:

Dear Sir and Brother—At the Eleventh Biennial Convention held in September, 1908, the Committee on Constitution and By-Laws recommended that a Funeral Expense Fund be established for the benefit of nonbeneficiary members, provided a two-thirds majority of all said nonbeneficiary members voting should vote for the same. This is to be decided by a referendum vote of said members.

It is provided that this fund be raised by an assessment of $3.00 per year being levied on all nonbeneficiary members, payable in two payments of $1.50 each, same to be paid on or before the first day of January and July of each year.

The amount to be paid in case of death of a member will be $175.00, to be paid to some person designated by said member, or in case the lodge takes charge of the funeral they will be permitted to expend an amount up to $175.00, and the lodge to be reimbursed from said Non-Beneficiary Funeral Expense Fund by the Grand Lodge.

Attached hereto is a ballot for you to fill out and sign as you vote for or against the creation of this fund. No ballot will be counted except the one printed herewith.

It is quite important that you vote either one way or the other, as the action of the convention provides that members *shall* participate, provided two-thirds of the members voting vote in favor of the establishment of this fund.

The ballot should be signed and returned to the General Secretary and Treasurer not later than the first day of May. *Ballot received by General Secretary and Treasurer after May 1, 1909, will not be counted.*

Yours fraternally,
A. H. HAWLEY,
General Secretary and Treasurer.

BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN,

To the General Secretary and Treasurer:

Dear Sir and Brother—I desire to record my vote .... (for or against) ....the establishment of a Funeral Expense fund for nonbeneficiary members.

Fraternally yours,
....
Member of Lodge No. ....

Be sure to place number of your lodge on ballot.

You will see by this that all you have to do is fill out the ballot attached and return the same to this office. If any nonbeneficiary member fails to receive a copy of the above notice and will so advise me, giving his proper address, we will be pleased to forward him a copy.

Official Correspondence to Bear Lodge Seal.

Many letters and other official papers which come to this office do not bear the lodge seal. The only way we can tell that the communication is official is to look up the correspondence of the lodge and find some communication with the lodge seal on it, and many times it is necessary to return the papers to have the seal attached. It will assist us materially and avoid much delay of action on many papers if the seal of the lodge is impressed on all communications sent to this office. I will appreciate it very much if those who have occasion to correspond with this office will comply with this request.

Bonds of Financial Secretaries and Treasurers.

For the information of officers and members of subordinate lodges, wish to say that, as provided in sections 152 and 153 of the Constitution, the financial secretary and treasurer of each lodge has been bonded through the Grand Lodge office, same having become effective March 1, 1909.

Murphy Monument Fund.

Received by A. H. Hawley, General Secretary and Treasurer, from February 12 to March 12, 1909:

The following lodges have remitted $1.50 each: 95, 153, 207, 265, 298, 364, 388, 389, 430, 476, 515, 519, 547, 568, 588, 620, 650, 674	$27 00
Lodge 423	5 00
Total for month	$32 00
Previously reported	662 70
Total receipts to date	$694 70

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DOING RIGHT

(Reply to Doing Good, appearing on page 144 of the January issue.)

Be not deceived by idle words,
"That glorify the day,"
Wherein you drop some golden deed
"Along life's thorny way."
Some greater virtue must be shown
"To save your soul from hell,"
When you are in the balance weighed,
"For every act shall tell."

Be not deceived, "God is not mocked,"
And "Whatsoe'er ye sow
That shall ye reap;" the time will come
When all our deeds must show.
And if your soul from hell be saved
By any single deed,
The Bible is a useless book,
And purposeless our creed.

But he who lives a constant life,
And strives through every day,
To live that life which God intends,
Has found the "narrow way."
And through the blood of Christ our Lord,
Which cleansed his guilty past,
The chains are loosed which bound his soul,
And he is saved at last.

C. P. HUBLER.

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Forum

A New Consolidation.

I have read with great interest the articles written from time to time on the question of the consolidation of the B. of L. E. and B, of L. F. and E. While much has been said both for and against such consolidation, there is still much that can be said in its favor. Many reasons can be given why such a union of forces would be of great advantage, not only to engineers and firemen, but to the whole field of union labor, and especially to the great body of men employed in railroad service.

I hope, however, that the discussion of this question will be passed over for awhile, and that we devote the present and near future to the cultivation of a better understanding between the two orders; a consolidation of principles, of ideas and of feelings; a condition which must exist before there can ever be any joining together of the two Brotherhoods,

While I may, at another time, say something concerning the union of the two forces, I wish, at this time, to speak of a new consolidation, one that is of the greatest importance to us. That is a consolidation of our own membership, a union of our own forces and energies for the development of our lodges, the advancement of our cause and the upbuilding of our Brotherhood.

The great weakness of the human race is the desire for power and the wish to rule. This weakness among the members of an organization often leads to the development of factional differences. And I am afraid that our own brothers are not entirely free from such a tendency.

Of all divisions that can come to an organization the most dangerous is a factional division.

Two queens cannot rule in the same hive; neither can two kings successfully govern the same nation. Then it must follow that rival factions cannot build up a lodge; neither can a division among the members of an order lead to the advancement of that order.

We are a band of brothers organized for our own mutual interest, and the protection of those dependent upon us for their daily bread. We are one great family reaping jointly the benefits of our Order. We are all working for the same purpose; all looking forward to the same reward for our labors. The good things that fall to one quicken the heart throbs of another. The misfortunes of some cast a gloom or a shadow over others.

> "We share our mutual woes,
> Our mutual burdens bear;
> And often for each other flows
> The sympathizing tear."

Then let us lay aside all personal matters and personal feelings, Let us bury this factional tendency when it is in its infancy and, across its grave, join hands with a stronger determination to work with renewed energy for the best organization known among working people.

We can never *force* the B. of L. E. to unite with us; if we would therefore have them to *voluntarily* come over to us, we must have something that will be worth their coming for. We must have an order so united in strength, so strong and firm in the consolidation of its own membership, that they will be drawn into our ranks by the desire to share the protection and industrial freedom which we enjoy.

We can have such an order as this, yet we can have it only by a united effort, a consolidation of energies and a unity of feelings. And let me say here, that the member who cannot lay aside his own personal feelings for the sake of his lodge and in behalf of his order, is a brother in name and not in deed or in fact; a member who will tear down but who can never build up a lodge. "In unity there is strength. United we stand, divided we fall."

As we look back upon the past and view the records of nations; as we read the history of the world we find that every success has been achieved by united effort and a *clinging to the* right.

In the tide of human affairs,

> "There is a time, we know not when;
> A place, we know not where,
> That marks the destiny of men,
> To glory or despair."

Just as truly as that time comes to individuals, just that truly does it come to organizations. Then let us not mark our destiny to despair by a division within our own ranks, but, by a united effort, push onward and upward to higher and nobler things.

Then there is another reason why this new consolidation is necessary and important to us. We can see all around us by personal observation that capital is using every means, both fair and foul, for the destruction of organized labor.

Benedict Arnold turned traitor to his country for the sake of personal revenge. Men today, both rich and poor, frown at the mention of Arnold's name. Yet these same men of wealth will employ spies to betray organized labor and obstruct its great work.

Brothers, I want to say to you that Benedict Arnold, with all his faults, with all his blackness of heart, with all his desire for revenge, was a man of honor compared with him who today, for the sake of a few paltry dollars, will betray his brother worker. Arnold was an honest man in comparison with such a creature who, for the sake of power gained through the accumulation of dollars, will crucify his fellow-man on a cross of gold.

We see our laws openly violated by capital. We see our courts corrupted, our judges bought and our legislators bribed. Injunctions are granted when wished for in the interest of capital, but never in behalf of labor. Only a few weeks ago three of our labor leaders were sentenced to prison, not because they violated any law, but because they did that which they honestly and conscientiously felt to be right; because in the exercise of their constitutional rights they placed on the unfair list a corporation that was unjust to union labor. Yet we see such corporations as the L. & N. R. R. openly violating the same law; openly boycotting organized labor and our courts are seemingly blind to this fact. If we would accomplish greater things for ourselves we must have the concerted efforts of our entire membership.

In the great warfare waged for the past quarter of a century in behalf of labor no army has more firmly stood its ground or more bravely battled for the right than has our own Order, then known as the Brotherhood of Locomotive Firemen. We have won because our cause was just; because we fought not for might but for right.

Our influence has been felt far and wide. Already we are recognized across the ocean. And should the time ever come when the B. of L. F. and E. goes down in defeat I believe I can say without fear of contradiction that that defeat will be a death knell to organized labor.

The world is watching with a never-closing eye the outcome of the American Republic. Other nations are forming their governments after ours, and the great world powers shudder when they realize the possibilities in the united efforts of the sons of America. So does the laboring world watch with anxious eye the result of the organized efforts of American labor. And great corporations realize that there is a wonderful power in the concentrated forces of the B. of L. F. and E.

Now, brothers, we are entering on a new period of our history. We are entering under new laws, under new conditions and under new leaders. Then let us begin under a new consolidation; a concentration of energies and a unity of efforts within our own ranks. And as the years roll on, and we grow stronger in numbers we will grow stronger in honor and usefulness.

Other organizations, seeing the fruits of our new consolidation, will follow our lead. Then, and not till then, will labor come into its own.

Then, when we stand out upon the evening of life and look across the waters, we will see other nations sharing the industrial freedom and liberty which we enjoy. And we will hear one sweet strain of music as they, too, look across the seas and fixing their gaze upon the Goddess of Liberty, all join in one grand chorus:

"From Liberty's uplifted hand,
New light seems shed upon our land;
New light whose penetrating rays
Reach distant shores and future days."

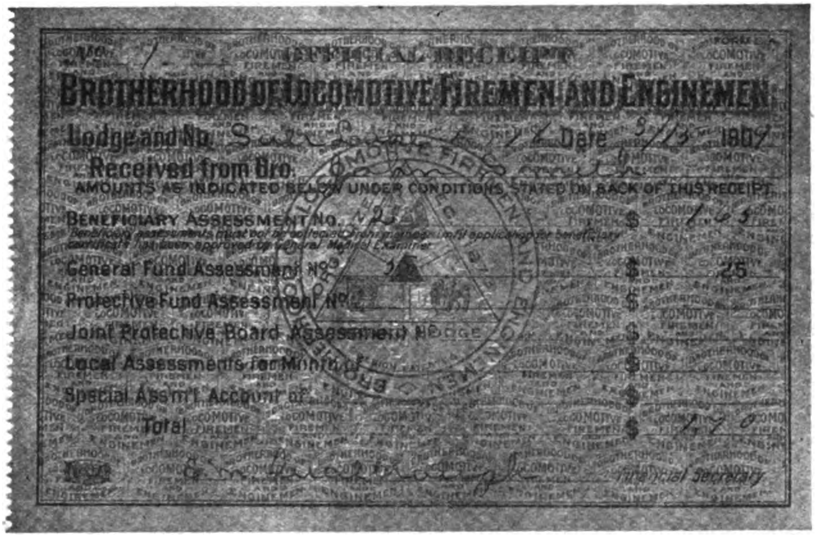
F. S. FOSTER,
Lodge 618.

* * *

A Suggestion.

The new "gold certificates" headed "Official Receipt Brotherhood of Locomotive Firemen and Enginemen" are in the hands of the financial secretaries, and as the writer, who happens to hold such an office, has to do with these receipts to a greater or lesser degree, he feels that a suggestion as to their make-up might not be amiss. In suggesting a receipt he hopes to stir up sufficient discussion on the part of his brother financial secretaries and others interested to bring about some system of receipting to due payers that will answer all purposes and diminish the worry and work of all receipt writers, payers and readers, or else be shown that his idea of what a receipt should be is an erroneous one.

Our constitution tells us that the receipt must bear the actual date of payment. And to illustrate: Bro. John Smith wishes to pay, say, on March 15, 1909 (pay day), his dues for the month of May, 1909. You see John is one of the brothers who is not afraid to pay in advance. As his financial secretary, I get out a pad of the new "gold certificates" and begin to write



No. 1 OFFICIAL RECEIPT

BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN

Lodge and No. Salt Lake [illegible] Date 3/15 1909

Received from Bro. John Smith

AMOUNTS AS INDICATED BELOW UNDER CONDITIONS STATED ON BACK OF THIS RECEIPT.

BENEFICIARY ASSESSMENT No. 2 $ 1.65

Beneficiary assessments must not be collected from members until application for beneficiary certificate has been approved by General Medical Examiner

General Fund Assessment No. 5 $ .25

Protective Fund Assessment No. $

Joint Protective Board Assessment No. $

Local Assessments for Month of $

Special Ass'm't. Account of $

Total $ 1.90

Financial Secretary

Lines 3, 4 and 6 are left blank because John is looking for a job, Line 5 is left blank because his lodge happens to have money enough in the treasury to pass the May local assessment. John gets what is coming to him through the mail in some town that is strange to him and he to it. He hunts up a president and shows his nice new "gold certificate." John is and always has been a lucky fellow, and so approaches a kind-hearted brother, who reads, smiles and says, "You may be a B. of L. F. and E. man all right, but I don't see how I can tell from this. I'll do the best I can for you on your card and your word, but I am afraid that won't be just what you want. If I had the time to look up what that '2' and '5' means, maybe I could see my way clear to give you what you want."

Keeping track of these assessment numbers involves too much unnecessary work for the due-payers as well as the financial secretaries, who have receipts to write for members who are paying up back dues of several months standing as well as dues several months in advance. The great bulk of receipt receivers or receipt readers neither know or care the number of any assessment. The all-important question with them is "How long is it good for?" and this information they should be able to obtain from the receipt itself at a glance.

It may be that a brother cannot get to a postoffice every month to buy a money order, or, if he can, he may not care to patronize Uncle Sam to that extent. His wish is to send in his dues for, say three months, beginning April 1, 1909. Now he does not want one or three of these bright "gold certificates" with a series of numbers on it or them in return for his money. What he does want is a receipt showing his April, May and June, 1909, dues paid. And any time he presents that receipt for inspection the reader wants to be able to read dates, while the writer wants one blank receipt to fill out that can be made to show one or more months' dues paid.

During the writer's experience (several years) as a collector of dues, he cannot recall a single instance when he was asked for the number of any assessment. The question has always been "How much are my dues?" For the most part this is all a brother wants to know at paying time. One item on the receipt blank which will include Beneficiary Assessment, General Fund Assessment, Protective Fund Assessment, and Local Assessment for the month is sufficient for the receipt writer and the larger per cent. of the receipt receivers and readers, a second line for special Grand Lodge assessments, a third line for special Joint Board Assessments, and the remainder of any number of convenient lines left blank for the financial secretary to use if needed.

While we are at it let us by all means omit the figures 25 on line 2. Omit them because they are not on the stub, because the writer cannot make figures like them, because they annoy in footing up the items, because the written figures do not look well when compared so closely with the printed ones, and because the receipt writer may want to make a 50-cent or a 75-cent item there.

Let us cut out work by cutting out the itemizing. Brothers who attend lodge meetings know what the items are, and those who do not attend ought not to ask for the extra work. The reason for the necessity of a financial secretary itemizing all the moneys to his treasurer is very plain, and this is very simple and unerringly accomplished as follows:

Name.	Date.	Receipt No.	Beneficiary Assessm'nt.	General Fund Assessment.	Protective Fund Assessment.	Joint Protective Bd. Assessm'nt.	Local Assessment.	Special Assessment.	Total.
J. Smith...	3-15-09	1	$1.65	$0.25	....	....	....	....	$1.90
J. Brown..	3-16-09	2	1.10	.25	$0.10	$1.00	$0.50	$1.40	4.35
B. Jones...	3-17-09	3	55	.25	....	....	.50	....	1.30
C. Black...	3-18-09	4	6.60	.75	.30	....	1.50	....	9.15
A. Snow...	3-19-09	5	3.30	.25	.10	1.00	.50	1.40	6.55
			$13.20	$1.75	.50	$2.00	$3.00	$2.80	$23.25

These figures, footed and cross-footed, must balance if correct. An itemized statement of the footings is drawn off, the total cash taken to the bank and a certificate of deposit to our treasurer gotten. This certificate is placed to the lodge's credit and the itemized statement sent to the treasurer, who sends a receipt for the total back to the financial secretary. This receipt is then pasted on the page which it balances and the two tell the story.

In this way our treasurer by paying the bills by check handles all the money without ever seeing a cent.

Why should the financial secretary be compelled to write the names of the hundred or more members each month with the amount opposite their names and forward same to treasurer? What does the treasurer care who pays? What he wants to know is, who does not pay. Every penny that has ever been paid me has been itemized to our treasurer, but he has never asked me to work overtime and write him the name and amount of each payer, and the members of my lodge are not going to expect me to put in the necessary time in itemizing their receipts.

And now last, and the last should be first, how can any President who has taken our obligation give the holder of one of these "gold certificates" the secret work for three months when his receipt is only good for one month?

Hoping that one groping in the night may be led to sunshine, I am,

Fraternally,

E. M. QUALTROUGH.

* * *

Economy in Our Brotherhood.

If there is any one question in which our membership as a whole is directly interested at the present time, it is the question of economy and of handling the affairs of our Brotherhood upon as economical a basis as possible, and still maintaining the exalted position that we hold among the labor organizations of the world. In this day and age the idea is prevalent among a certain element in the labor world that in order to appear truly great and to exhibit gigantic strength to those not affiliated with labor organizations it is necessary to incur an extraordinary expense upon the membership at large.

I am fearful that this idea is growing in our own Brotherhood, and feel inclined to call upon our brothers throughout the land to consider well the man that handles the scoop before taking any steps that will work a hardship upon him or those that are dependent upon him for sustenance.

It is the man with the scoop that has caused our Brotherhood to exist through the many trying ordeals through which it has passed in previous years, and it is he that must perpetuate those principles of right and justice that were handed down to us by the founders of our organization. We should, as a body of thinking men bound together by ties of fraternal love, legislate at all times and under all circumstances for the benefit of the men who suffer most severely from the burden of heavy assessments. Our Brotherhood for a number of years has been blessed by an unprecedented growth. Indeed it has grown and flourished as the green bay tree. This condition has been brought about because of the economical methods practiced in the past, and the fact that we have been duly considerate of our membership as a whole. Those who were in attendance at the sessions of the Eleventh Biennial Convention must admit that the expenditures of that body were much in excess of what they should have been, and for no other reason than the fact that the delegation was so large that business could not be transacted in a systematic way. Year after year new lodges are added to the already large number of lodges that compose our organization, and as these new lodges are organized the number of delegates to our conventions are increased and this means an increased expense in the pay of delegates.

Think, brothers, of the enormous sum of money that was expended at the last convention, and then think of how this money was made and who placed it in the treasury of our Brotherhood. Was it not the man who handles the scoop? Is it not time that our brothers were finding a solution to this vexing problem with which we are now confronted? It is my honest opinion that there is but one proper method to be employed in adjusting this matter, and that is by reducing the representation to our international conventions. Experience is a splendid teacher, and it was the knowledge received from this instructor that caused Champ Clark of Missouri to give an interesting interview to the press of the nation upon his return from the late national Democratic convention, that it would be to the best interests of the great political parties to reduce the number of delegates to future conventions, as it was almost impossible to transact business with the large delegations that always attend these conventions.

I believe that 250 delegates in a convention hall can transact as much business in two weeks as 750 delegates could transact in the same hall in four weeks, and I believe, too, that the wily lodge politician would find less time to ply his trade, and that the cloak and smoking rooms would not be taxed to the limit of their seating and standing capacity by those looking out for their own personal interests while the faithful delegates are on the floor of the convention transacting business for their brothers who are paying them for their services. It is high time that the members of the 760 lodges of our Brotherhood were discussing this question in their secret councils and taking some definite action that will lead to a betterment of existing conditions, and be prepared to wipe out this unnecessary expense when the Twelfth Biennial Convention meets in St, Paul. We have just passed through one of the most severe panics that has ever been recorded in the annals of our history as a nation. A panic that has wrought disaster to business interests, it is true, but a panic that has brought hunger and distress to the man who has been compelled by circumstances to earn a living in the sweat of his brow. Who has suffered more during this panic than the fireman and engineer? Who has had to fight for an existence on the extra board, catching a trip now and then as the opportunity presented itself? Yet these men, struggling against tremendous odds in order to keep the wolf from the door, have remained with the organization and, as a rule, have paid their dues and assessments without a murmur.

Should their faithfulness to duty lessen our obligation to make their burden as light as possible? We have in our organization sixty-six thousand members that pay into the treasury $132,000 biennially for the purpose of remunerating delegates for their services while attending our international conventions. Suppose that one-half of this amount could be paid out for the next few years to our disabled brothers in different parts of the country, or be placed in the protective fund of the organization; how much more good would its use accomplish? Let us hold with unflinching tenacity to the principle of "equal and exact justice to all," adhering strictly to the policy that an economical administration of the affairs of our Brotherhood is the safest and surest way of retaining the prestige that we enjoy among the labor organizations of the world.

R. C. FARROW,
Lodge 440.

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Twenty Years Ago.

Dedicated to Michael J. Kelly, engineer, I. C. R. R., and relating to the construction of the Western Division of that railroad in 1888, and published by request of members of Lodge 47:

I've wandered through the country, Mike,
I've had my share of strife;
I've seen the big and little things
On every side of life.
I've been to every city, Mike,
And I've seen the grape juice flow;
But my happiest days were spent with you
Just twenty years ago.

I remember Rinert's old farmhouse,
'Way over on the hill,
Near the village of South Elgin—
'Twas then called Clintonville.
And the room in which we slept
Had a ceiling slanting low,
And my head went through the plaster laths,
Just twenty years ago.

I recall the old Fox River, Mike,
With its shallow, rocky bed,
And still I hear its murmuring sound
Like a requiem to the dead.
And perhaps that's what its doing, Mike,
For the ones we used to know
Are mostly dead and buried now,
Since twenty years ago.

I remember poor Dick Ormsby, Mike,
And Harry Stanley, too;
Their fate could best related be,
By the railroad wrecking crew.
They died at their post of duty, Mike,
And were picked up in the snow,
And their souls are marching onward
Since twenty years ago.

I remember those old engines, Mike,
And to think we're still alive;
You had the good old one-nineteen,
And I the fifty-five.
We filled the cans and scoured the brass,
And helped to buck the snow
While building the Madison-Dodgeville lines,
Just twenty years ago.

But now we are getting old, Mike,
And our hair is turning gray;
The autumn leaves are falling fast
And showing life's decay:
But when the final callboy comes,
And we're both called to go.
May we meet again and happy be,
As twenty years ago.

—By J. K. FINN, formerly a member of Lodge 47.

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Canadian Grand Union Meeting.

To All Members of the B. of L. F. and E:

At the last Union Meeting held at Hamilton, Ont., in 1907, it was unanimously voted that Winnipeg be the venue of the next Union Meeting. That being so, it behooved Lodges 127 and 597 to gird up their loins and get to work, which they did by forming a committee composed of members of both mentioned lodges. Said committee having been at work now for the past six weeks, matters are assuming definite shape and prospects point to a bumper time.

The Canadian Union Meeting will be held August 3, 4, 5 and 6, 1909.

We possibly have not the facilities for the same kind of entertainment which other cities have been in the habit of giving our brothers, but we can do so in other ways which will be a departure from the previous routine, and it is an undoubted fact that a change is an entertainment in itself,

In tendering this invitation we say: "Come and see Winnipeg, the outcome of the indomitable courage and dogmatic perseverance of the early settler.

"Come and see Manitoba in the glory of her harvest time, when she looks like some vast lake of gold waving in the summer breeze, which was but a few years ago nothing but a waste of wild prairie grass and scrub.

"Come and see our business thoroughfares, which twenty-five years ago were sloughs, and now compare with any other city of Winnipeg's size.

"Come and join in our pleasure trips,

for which we are making most particular arrangements, saving no trouble and expense."

We, as a body, feel that if we have a representative number of American brothers as our guests, our looked-for success will be the greater.

At an early date we will publish in the Magazine full particulars regarding accommodation.

Hoping that as many brothers as possible will take advantage of this trip to the great Northwest, we are,

Yours fraternally,
JOINT COMMITTEE,
Canadian Union Meeting.

* * * * *

Correspondence

LODGE 517—(*John N. Haldren, Bluefield, W. Va.*) All during the panic I worked hard to get Tug River Lodge 517, Williamson, W. Va., instituted. I finally succeeded. Sixteen non-Brotherhood men were taken in on February 7th and fifteen more on February 21st, and they are expecting at least ten more new members to be initiated soon. All the new members seem to be taking an interest in this lodge and we hope will continue to do so. Bro. A, P. Kelly was the organizing officer, and he gave a good lecture in the R. R. Y. M. C. A. Lodge 446, of which I am a member, is also prospering and taking in new members.

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LODGE 209—(*Member, Schenectady, N. Y.*) I note what Member, Lodge 6, has to say about the Garnishee Bill. He has hit it right; it surely is a bad thing, not only for dishonest men, but for honest men as well, especially a man with a large family and small wages. The only good it does is to help make a good mathematician of a man, as it keeps him busy figuring out how to make $12.50 weekly wages pay $14.00 in bills.

I like our Magazine and I read it from cover to cover—don't skip much of it. I like to read the letters from all over the country; they are very interesting, but I don't see any from Lodges 209 and 210. I am a charter member of 209, and pretty close to the last one of them, as a good many of the boys have called in their last flag and made the last run since we organized 209. In all these years I don't remember of losing but one number of the Magazine. It has followed me around the country, wherever I have been, and I have watched it grow from a little bit of a book to the splended big book it is now. Sometimes the only copy in the mail was mine. It is a welcome visitor and always will be until my name appears in the claim statements. I see many things in the Magazine I might criticise, and plenty of articles on subjects I would like to comment on, but I think this will do for this time, and if this is received with favor I may come again.

* * *

LODGE 755—(*Member, Perth Amboy, N. J.*) As long as Pride of Amboy, Lodge 755, has been organized I have seen nothing regarding it in the columns of our Magazine. So I will try and make a start myself. The brothers who read this can easily tell that I am not used to doing very much corresponding, so I hope they will overlook same, and maybe some other member will try his hand.

Although work is very slack with our boys and this is a new lodge, organized last September, we are doing a little business in the lodge room, and occasionally have a job for the goat. At the meeting on the third Sunday of January we had the pleasure of introducing two new members to our mystic ceremonies, and they were very well satisfied when it was over with. I am very glad to say that the members are very good in their attendance at meetings, Our lodge is a small one, consisting of a little over thirty members, but we have prospects of getting a few more candidates soon, as we are doing our best to encourage the young men who are not members to join us. As this is my first attempt, I hope to hear from some one else through the Magazine. It is very interesting to me to read of the brothers in the different sections of this broad land. I wish all the brothers the best of success and trust that times will soon get better. I remain one of the Tried and True.

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LODGE 242—(*Member, Elmira, N. Y.*)

Just a few lines will do
From Lodge two forty-two,
To let you know
We're not so slow,
But wide-awake and on the go.

I desire to let the Brotherhood at large know that we are making rapid strides forward. Prosperity is a word of very broad meaning, but the members of our lodge in the past few months have learned its significance to its fullest extent. Our members, as well as our officers, are at all times wide awake and on the alert for new recruits. Our entire membership is banded together as one committee to secure new members, and they are meeting with unusual success. At our first meeting in February ten new candidates were initiated, and had it not been for the fact that our goat called for rest we could have accommodated a few more victims. This meeting was one of the best that our lodge has held in some time, there being a good attendance and a great amount of interest manifested. One of our members has invented what we term the "Mysterious Chair," which certainly is properly named, and which promises to be a keen rival to the old-time goat in effectiveness. It has already been well broken in, as some of our lately admitted members can testify, they thoroughly understanding its effectiveness.

Our meetings for some time past have been well attended, especially by our engineer members who, by the way, are all retaining their membership in our Order, there being but one withdrawal issued during the past year. The prosperity of 242 seems remarkable just at this time, when one considers the depressed condition of business throughout the country, which does not seem to revive on the Lackawanna Railroad. The regular firemen here have circulated an agreement to divide time with extra men, thereby avoiding a reduction of force, which naturally would prove disastrous to our Order, as many of our newly-admitted members would be unable to retain membership should they be temporarily laid off or unemployed. There is yet plenty of material from which to secure new members, and not any of our active members will cease in their efforts until all eligible to membership have joined our Order, There are but few men employed at this point enjoying the advantages of our organized labor who are eligible to membership that absolutely refuse to be numbered with us. These very ones, however, are always the "calamity howlers" and the first ones to object should the slightest injustice be done to them; still they refuse to join our ranks, fully realizing that they have no one to adjust their grievances and, above all, they have no protection for their loved ones should an accident befall them. I cannot understand why it is that such men can act so resistful when they view their surroundings and are made to realize that many of the things which they enjoy, such as increased wages, lesser duties, shorter hours, etc., were gained through the efforts of their organized fellow workmen; still they refuse to contribute, either energetically or financially, toward securing these advantages. We are persistent in our efforts, and until these men have joined our ranks we intend to give them no rest.

Not only have we been successful in securing new members, but financially we are in a flourishing condition. Brothers, let us become imbued with the spirit of progress and endeavor to roll up 90,000 members for the 1910 Convention.

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LODGE 711—(*Member, Braddock, Pa.*) We are still doing business at the same old stand, and for the benefit of the brothers who have forgotten where we meet I give the location of our lodge room, which is on the corner of Eighth street and Braddock avenue. We are experiencing a great deal of trouble in getting the brothers to attend lodge meetings regularly. They seem to want to leave it all to a faithful few. Business is very dull at present out here and there is no excuse for the members not attending regularly; some of them have not been in the lodge room since it was organized. Brothers, it is time to get busy, as we have quite a number of men in this vicinity who are eligible to become members of the B. of L. F. and E. Speak to them and not leave the work to a faithful few. A word from you may do them more good than one from me. Summer will soon be here and we will all have all we can do to take care of the new men. Let us all put our "shoulder to the wheel" and we can then say, "We've got 'em all to a man."

We have a good set of officers, who are doing all in their power for the good of our excellent Order, especially our worthy Financial Secretary, Bro, McWilliams, who always tells us it is getting about time to pay up, and as a word to the wise is sufficient, he has very little trouble.

We have some of the largest simple engines in the world and a fair grade of "real estate" to fire with. We are required to spend a large portion of our spare time wiping and cleaning. We have a good set of officials to work for as long as we "hit the ball" and keep the required pressure on the gauge and throw the switches on our conductors where they only have a conductor, and then very often our job depends on what the conductor had for breakfast.

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LODGE 270—(*Member, Minneapolis, Minn.*) We have one of the best lodges in the country, with about half firemen and half engineers, always trying to build and push the Order up. There has been quite a number of our young firemen promoted in the last few years and I am glad to say that the most of them are still with us. Bros. Harley, Walker and Kittleson cannot be beat when it comes to settling trouble. I am working on the River division of the C., M. & St. Paul R. R., and business is good. Everybody is working, We have a good set of engines, but not the best of coal.

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LODGE 60—(*H. F. Craig, Philadelphia, Pa.*) Our members are putting their shoulders to the wheel and getting new members in at nearly every meeting. Our friend Billy is in fine shape to take new members over the rocky hill to safety on the roads of "Hope, Faith and Charity." We have about 175 members now, and before the warm weather is here we will have 200. We have two new applicants waiting initiation at this writing. We recently had a visit from Bro. Carter, he having attended our anniversary. He did not give us a speech, but shook hands with all of us and said he hoped to meet us all again soon.

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LODGE 362—(*Member, Niagara Falls, N. Y.*) We are doing good business here, considering the hard times, and have hopes of getting more members before long, as there is quite a number of our firemen that are not yet members of the Order. We have an excellent lot of officers, of which we are proud. The officers previous to those at present in office we wish to thank very much for their services.

We have a number of engineers in our Order here and they take good interest in the work going on. Engineer Frank White is right onto his job when it comes to taking up the grievances for the firemen, He has helped us firemen a number of times, and many thanks for his help and the interest taken in our lodge. Then comes Bro. James Devlin (he's known here as the Quaker). He's true blue. He and Bro. White are the best there is to work with. We have good engines now on the Western Division of the New York Central; also a good company and a good roundhouse foreman. Messrs. Geo. Sienier and Michael Fell see that the work is done well on the engines.

This (Washington's Birthday) is a great holiday. I hope the brothers are striving to show their patriotism in the way they celebrate. The great around-the-world-battleship-fleet returns home today and the welcome they receive will never be forgotten. Several of those boys are from Niagara Falls, and they will be welcomed home as the flowers are welcomed in the springtime.

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LODGE 304—(*Member, Little Rock, Ark.*) I. always take pleasure in reading the Magazine, but this is my first attempt in writing for it. Business remains about the same here. Several of the engineers were cut off the board on the Valley and Central Divisions, but they are to be placed on the extra list, and that will help some of us out.

Our tonnage was reduced several hundred tons on the Valley Division, consequently we don't handle as many scoops of "black diamonds" and we get over the road better, which makes one have a different feeling. As a rule we have good coal, but occasionally we are unfortunate enough to get a tank full of what might be called "real estate."

I am glad to learn such good reports from other lodges, and realize that there can be no question but what co-operation makes our Brotherhood stronger. Let us hope that the boys will continue to take real interest in the welfare of the Brotherhood and show up regularly at lodge meetings. We wish all the members of the B. of L. F. and E. the highest degree of success.

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LODGE 762—(*Visitor, Indianapolis, Ind.*) Moorefield Lodge 762 was organized at Indianapolis, Ind., on Saturday evening, February 28th, with fourteen transferred and ten newly initiated members.

The degree team consisted of Brothers Farrell, Zink, Barneclo, Wiley and McKeever, of Lodge 14; Brothers Wilcox and Schmidt, of Lodge 16; Brother Davis, of Lodge 19; Brother Hanley, of Lodge 22; Brother Wood, of Lodge 52; Brother McGuire, of Lodge 269, and Brother Hoover, of Lodge 449. They handled the work in a very becoming manner and in a way that will not soon be forgotten by those present.

The new lodge started out under very favorable auspices, the greatest interest having been manifested by all the members, and there is every reason to believe that Moorefield Lodge will be one of the banner lodges of the State of Indiana.

An excellent set of officers were selected and installed. Recording Secretary Fisher is a good scribe and will make an ideal officer. President Kelleher has good horse sense and a level head, indispensable qualifications for a presiding officer. Niemier has been tried and never found wanting. Stevens is a hustler and will make things count. Casey is an able advocate, and as a member of the protective board will protect the rights of his constituents.

After the new officers had been installed Bro. John F. McNamee, Editor and Manager of the Magazine, who organized the new lodge, gave one of his sharp, snappy, characteristic addresses on organized labor in general and the Brotherhood of Locomotive Firemen and Enginemen in particular. He reviewed the history of our order, the good work it had accomplished in the past, and reminded us of what it could and would do in the future providing the membership continued to show the same interest that has been in evidence for the last few years.

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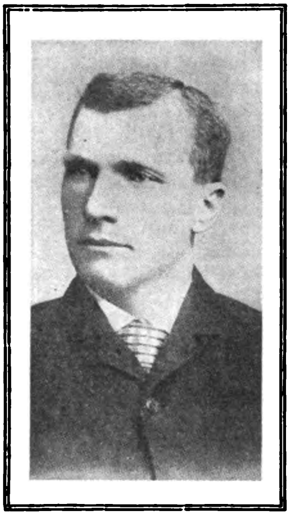
Official

Addresses Wanted.

Persons requiring the address of or any information concerning another will please communicate with the secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the secretary of such lodge, requesting that a notice be published in the Magazine inquiring for such address or other information, same will be complied with. However, the Magazine cannot undertake the office of a collecting agency, and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the person specified in the notice:



GEO. W. CHASE

George W. Chase.—Is a son of Russell F. Chase, formerly a resident of Tully, N. Y. Left home nearly twenty years ago and has not been heard from for about twelve years or more. As far as can be remembered, he was firing on the western division of the N. Y. C. R. R. between Buffalo and East Syracuse, N. Y., during the winter of 1889-90, under Master Mechanic George Watkey. During the spring of 1890 he again disappeared and was heard from indirectly as an engineer on the Monon route between Chicago and Indianapolis, but a short time after that he was again lost track of. It was believed that he went to El Paso, Texas, to work with Mr. Watkey, who had gone to that city. His picture appearing herewith is, of course, an old likeness, but it may help in locating him. His brother is very anxious to locate him. Any information concerning his whereabouts will be appreciated by H. B. Chase, Tully, N. Y.

Harry T. Curry.—Formerly fired on the Mohawk Division of the New York Central and Hudson River Railroad. Anyone knowing his whereabouts will please correspond with his sister, Mrs. J. T. Myers, 30 Charlotte street, Worcester, Mass.

Alonzo Emmons.—Usually goes by the name of "Lon." Is a blond and five feet eight inches in height; weighs about 150 pounds, has several teeth filled with gold and some crowned. Fired some on the Santa Fe Railroad in New Mexico, When last heard from was in Denver, Colo. Anyone knowing his whereabouts will please correspond with his mother, Mrs. Mary A. Emmons, Randolph, Mo.

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Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the secretary of the lodge which issued same:

Traveling card for quarter ending March 31, 1909, and lodge receipts belonging to Fred Phelps, member of Lodge 105, B. of L, F. and E., were stolen on the night of February 28th last. If anyone gets any trace of them please advise Fred Phelps, 326 East street, Hutchison, Kans.

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Acknowledgments.

Bro. J. M. Capehart, of Lodge 325, desires to thank the officers and members of his lodge, and of the B. of L. F. and

E. in general, for their kindness to him during his sickness and for the prompt payment of his disability claim. He also wishes to thank the members of Lodges 325 and 573, in particular, for their many kindnesses to him during his affliction. It is his earnest wish that the B. of L. F. and E. will forever prosper.

Bro. E. Steinmann, of Lodge 388, wishes to thank the Brotherhood of Locomotive Firemen and Enginemen for the kindness shown him during his hour of need and for the prompt payment of his disability claim allowed him by the Eleventh Biennial Convention. He earnestly wishes the officers and members of the B. of L. F. and E. the fullest measure of success and prosperity.

Mr. and Mrs. W. P. Broadwell, of Ludlow, Cal., wish to thank the officers and members of Lodge 327 for their great kindness to them during the hour of their great sorrow when they lost their only son, Bro. Hurbert C. Broadwell, in the wreck on the Tonopa and Tidewater Railroad on August 9th last.

Mr. Nelson A. Gilbert and family, of Willimantic, Conn., desire to extend their thanks to the officers of the B. of L. F. and E., as well as the members of Charter Oak Lodge 285, for the prompt payment of the beneficiary claim of their son and brother, Harry N. Gilbert, and the great kindness shown them at the time of his death.

Bro, J. F. McKinney, of Lodge 314, desires to thank the members of his lodge and the delegates to the Eleventh Biennial Convention, and the Grand Lodge in particular, for the granting of his disability claim and the prompt payment of same.

Mrs. John Reilly, of Norwich, Conn., wishes to thank the B. of L. F. and E. in general for the prompt payment of the claim of her brother, Thomas F. Gallagher, of Lodge 73, and the members of Lodge 73, and Bro. A. E. Abbott especially, of that lodge, for the great kindness shown the family and her brother during his illness and death.

Bro. T. J. Cunningham, of Red River Lodge No. 8, desires to thank the Grand Lodge of the B. of L. F. and E, for his claim of $500.00 which was allowed him by the Eleventh Biennial Convention. He is also very grateful to the members of his lodge for their great kindness and generosity in carrying him and keeping up his dues so long in the lodge. He was absolutely without means of support until his claim was allowed, and he appreciates it very much indeed.

Bro. Eugene Moon, of Lodge 410, desires to express his appreciation of the kindness shown him by the brothers of his lodge; also to thank the Brotherhood at large for the payment of his claim, which was allowed by the Eleventh Biennial Convention.

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The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of February, 1909:

B. of L. F. and E. Lodges 86, $6; 127, $25	$31 00
L. S. to B. of L. F. and E. Lodges 33, $5; 78, $5; 227, $3	13 00
O. R. C. Divisions	83 00
B. of R. T. Lodges	181 50
B. of L. E. Divisions	139 75
L. A. C. Divisions	16 00
L. A. T. Lodges	16 80
G. I. A. Divisions	25 00
James Costello, Division 270, O. R. C.	1 00
Alfred S. Lunt, Lodge 456, B. of R. T.	1 00
F. S. Barnes, Lodge 28, B. of R. T.	1 00
Mary Cusack, Toronto, Canada	1 00
Members, Lodge 638, B. of R. T.	3 50
Members of Division 649, B. of L. E.	7 15
Station 23, C. & N. W. Conductors' Room	3 10
Williard R. Lincoln Division 200, B. of L. E.	1 50
C. A. Schi, Lodge 575, B. of R. T.	1 00
L. E. Watkins, Lodge 89, B. of R. T.	75
W. F. Conor, Lodge 228, B. of R. T.	25
E. Stevenson, Lodge 214, B. of L. F. and E.	25
Total	$527 55

Miscellaneous—One quilt from Division 43, G. I. A.; box of canned fruit and two quilts from Division 339, L. A. T.; one quilt from Division 333, G. I. A.

Respectfully submitted,
JOHN O'KEEFE.
Sec. and Treas., R. R. M. H.

Beneficiary Statement

OFFICE OF GENERAL SECRETARY AND TREASURER.
PEORIA, ILL., March 1, 1909.

To SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of February, 1909:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	477 75	77	409 50	153	152 50	229	......	305	134 50	381	330 25	457	160 75	533	80 25	609	57 75	685	......
2	37 00	78	156 00	154	113 25	230	......	306	245 00	382	150 00	458	72 75	534	......	610	102 00	686	22 50
3	839 25	79	70 50	155	86 25	231	575 25	307	202 25	383	232 75	459	75 75	535	183 00	611	83 50	687	82 50
4	......	80	......	156	......	232	220 50	308	77 25	384	219 00	460	......	536	135 75	612	108 50	688	95 50
5	......	81	124 75	157	148 50	233	225 00	309	......	385	139 50	461	139 50	537	108 00	613	25 50	689	97 25
6	338 25	82	188 25	158	115 50	234	169 50	310	284 00	386	59 25	462	187 75	538	193 75	614	277 50	690	......
7	231 50	83	378 25	159	217 25	235	227 00	311	95 25	387	133 25	463	197 25	539	281 25	615	118 75	691	43 50
8	477 25	84	123 75	160	186 75	236	438 75	312	183 00	388	198 00	464	183 75	540	286 25	616	......	692	68 50
9	371 75	85	......	161	61 50	237	405 25	313	144 00	389	100 25	465	211 00	541	155 75	617	145 00	693	24 00
10	927 75	86	202 75	162	481 75	238	203 75	314	......	390	159 50	466	167 00	542	202 50	618	213 25	694	......
11	263 25	87	167 50	163	190 75	239	81 25	315	181 50	391	338 50	467	147 25	543	260 25	619	......	695	86 50
12	225 00	88	157 25	164	88 00	240	429 00	316	224 50	392	165 75	468	42 00	544	135 75	620	239 00	696	59 00
13	271 75	89	63 00	165	71 50	241	......	317	105 75	393	166 75	469	129 00	545	93 00	621	57 25	697	87 00
14	465 50	90	81 00	166	235 25	242	291 50	318	343 50	394	24 00	470	234 00	546	44 25	622	213 00	698	167 25
15	137 25	91	444 50	167	161 50	243	125 50	319	......	395	99 75	471	36 00	547	113 25	623	......	699	88 75
16	518 25	92	190 50	168	248 25	244	164 75	320	50 25	396	181 00	472	330 25	548	155 50	624	75 00	700	43 50
17	199 00	93	......	169	406 50	245	......	321	136 50	397	67 75	473	33 25	549	132 00	625	......	701	176 00
18	170 50	94	422 75	170	......	246	......	322	113 00	398	145 00	474	141 00	550	63 25	626	272 25	702	......
19	317 00	95	67 00	171	118 50	247	505 00	323	54 00	399	......	475	257 75	551	225 50	627	81 00	703	45 50
20	51 00	96	198 75	172	98 25	248	......	324	153 00	400	......	476	86 50	552	208 50	628	129 00	704	181 25
21	393 50	97	460 50	173	276 50	249	......	325	101 75	401	271 75	477	700 00	553	571 50	629	28 00	705	......
22	93 00	98	......	174	645 50	250	222 25	326	198 50	402	198 50	478	126 75	554	108 75	630	140 50	706	31 50
23	143 00	99	582 25	175	332 25	251	329 25	327	277 50	403	57 00	479	107 50	555	107 25	631	231 50	707	70 50
24	351 00	100	208 50	176	162 00	252	307 50	328	344 50	404	132 25	480	43 50	556	77 25	632	67 50	708	118 50
25	296 25	101	372 00	177	172 25	253	303 00	329	......	405	240 00	481	135 25	557	242 25	633	......	709	83 50
28	231 75	102	164 75	178	203 25	254	106 00	330	264 50	406	80 25	482	380 50	558	209 50	634	233 25	710	100 25
27	250 75	103	54 75	179	155 50	255	171 25	331	159 00	407	273 75	483	......	559	277 00	635	......	711	77 25
28	194 50	104	120 75	180	86 75	256	......	332	87 00	408	220 00	484	158 25	560	63 00	636	64 00	712	26 25
29	144 75	105	101 50	181	70 75	257	102 25	333	268 75	409	......	485	921 00	561	230 25	637	169 00	713	87 00
30	163 25	106	89 50	182	359 00	258	55 00	334	264 25	410	162 00	486	76 00	562	345 00	638	165 25	714	26 25
31	149 25	107	257 50	183	250 00	259	89 50	335	53 25	411	204 75	487	......	563	247 50	639	56 50	715	45 75
32	163 75	108	363 75	184	87 00	260	310 25	336	104 25	412	219 25	488	72 75	564	241 50	640	55 75	716	73 50
33	......	109	189 50	185	93 75	261	157 25	337	349 75	413	39 00	489	......	565	56 50	641	105 75	717	24 00
34	......	110	162 00	186	......	262	329 25	338	148 50	414	......	490	281 25	566	187 75	642	97 00	718	42 75
35	118 75	111	234 50	187	95 75	263	196 25	339	......	415	147 75	491	68 25	567	151 75	643	55 00	719	159 00
36	127 50	112	53 75	188	440 25	264	110 25	340	151 75	416	182 75	492	277 25	568	326 25	644	109 00	720	......
37	196 75	113	138 75	189	......	265	347 25	341	214 00	417	96 75	493	64 75	569	215 25	645	67 75	721	39 00
38	97 50	114	......	190	75 00	266	234 00	342	233 50	418	......	494	107 75	570	98 25	646	278 50	722	65 25
39	141 75	115	131 75	191	......	267	119 25	343	75 00	419	237 00	495	64 75	571	441 50	647	103 50	723	33 25
40	359 25	116	......	192	......	268	51 00	344	164 25	420	......	496	154 00	572	......	648	51 00	724	......
41	56 25	117	111 25	193	255 00	269	......	345	4 50	421	83 25	497	108 00	573	......	649	45 00	725	56 50
42	55 50	118	48 75	194	483 00	270	334 50	346	25 50	422	86 50	498	123 75	574	138 00	650	54 00	726	47 25
43	......	119	132 00	195	103 00	271	144 25	347	87 00	423	44 50	499	43 50	575	84 75	651	136 75	727	47 25
44	278 00	120	215 00	196	131 50	272	58 50	348	212 00	424	162 75	500	137 00	576	81 75	652	421 50	728	......
45	......	121	287 25	197	102 75	273	222 50	349	340 50	425	107 25	501	237 25	577	75 00	653	105 00	729	39 00
46	31 50	122	......	198	384 50	274	127 00	350	196 00	426	......	502	243 00	578	285 50	654	139 25	730	76 00
47	320 75	123	......	199	178 25	275	335 25	351	40 75	427	69 50	503	164 25	579	......	655	......	731	118 50
48	353 25	124	168 75	200	72 00	276	272 25	352	109 75	428	71 25	504	76 50	580	47 25	656	101 50	732	......
49	164 25	125	28 50	201	154 25	277	147 00	353	185 00	429	126 00	505	60 00	581	67 75	657	146 00	733	57 25
50	78 75	126	163 00	202	199 50	278	27 00	354	258 75	430	93 75	506	114 75	582	81 75	658	91 00	734	98 50
51	197 25	127	269 25	203	......	279	......	355	231 75	431	67 50	507	176 25	583	......	659	171 75	735	88 50
52	327 50	128	140 75	204	274 50	280	300 00	356	192 25	432	213 25	508	337 25	584	35 25	660	99 75	736	46 75
53	142 50	129	313 75	205	108 25	281	414 25	357	72 75	433	278 50	509	78 75	585	93 25	661	87 25	737	19 50
54	424 75	130	501 75	206	74 25	282	37 50	358	166 75	434	199 50	510	154 25	586	......	662	......	738	21 75
55	60 25	131	46 75	207	302 50	283	106 00	359	131 50	435	......	511	209 50	587	......	663	187 75	739	89 25
56	222 25	132	120 25	208	......	284	655 00	360	114 75	436	243 75	512	149 25	588	65 25	664	73 00	740	78 75
57	530 50	133	......	209	286 50	285	357 00	361	123 00	437	39 00	513	98 25	589	66 75	665	76 75	741	48 25
58	......	134	60 00	210	91 00	286	241 75	362	86 00	438	152 00	514	......	590	161 00	666	......	742	35 25
59	488 75	135	202 00	211	269 50	287	1182 75	363	453 00	439	96 25	515	183 00	591	229 75	667	82 75	743	......
60	380 00	136	66 00	212	217 25	288	......	364	150 25	440	215 50	516	158 25	592	130 50	668	114 00	744	21 00
61	133 50	137	108 25	213	176 25	289	130 25	365	40 50	441	......	517	......	593	164 75	669	66 75	745	38 00
62	93 75	138	292 00	214	555 00	290	197 00	366	......	442	129 25	518	......	594	157 75	670	275 50	746	72 75
63	471 50	139	......	215	384 00	291	70 50	367	194 25	443	206 50	519	275 00	595	59 25	671	103 00	747	61 50
64	458 75	140	331 75	216	133 00	292	39 75	368	103 25	444	861 50	520	40 50	596	120 75	672	96 00	748	57 75
65	214 50	141	645 50	217	216 50	293	......	369	184 25	445	237 75	521	171 00	597	165 25	673	726 00	749	101 25
66	150 00	142	206 25	218	246 25	294	......	370	69 50	446	178 00	522	258 75	598	99 25	674	43 50	750	44 00
67	114 75	143	397 50	219	259 00	295	333 25	371	170 25	447	157 00	523	151 50	599	114 75	675	177 00	751	......
68	......	144	51 75	220	572 00	296	369 75	372	162 50	448	672 00	524	46 00	600	193 75	676	55 50	752	63 75
69	......	145	......	221	149 25	297	280 50	373	186 75	449	323 50	525	159 25	601	250 50	677	137 75	753	48 75
70	198 75	146	......	222	120 00	298	350 50	374	159 25	450	303 75	526	42 75	602	415 25	678	......	754	......
71	334 25	147	231 50	223	......	299	134 50	375	91 50	451	159 25	527	141 00	603	134 75	679	......	755	64 50
72	329 25	148	276 25	224	183 00	300	255 75	376	39 00	452	146 75	528	219 75	604	......	680	85 50	756	33 00
73	238 75	149	435 00	225	133 50	301	292 50	377	202 75	453	54 00	529	179 75	605	......	681	134 50	757	75 00
74	......	150	317 25	226	292 50	302	400 75	378	559 25	454	163 25	530	129 00	606	28 50	682	......	758	33 00
75	457 50	151	134 25	227	106 25	303	115 50	379	379 75	455	......	531	106 75	607	......	683	358 75	759	......
76	......	152	326 00	228	439 50	304	......	380	107 25	456	......	532	123 25	608	388 25	684	......	760	135 25

Received during month of February **$120,224.25**

Respectfully submitted, **A. H. HAWLEY, G. S. and T.**

Statement of Death and Disability Claims

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM JANUARY 31, 1909, TO FEBRUARY 28, 1909.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
1363	Geo. W. Dunigan	328	Death	Sept. 3, 1908	$1,500	Boiler explosion.
1532	W. T. Kane	36	"	Oct. 26, "	1,500	Pyelitis.
1515	Arthur Alt	412	"	Nov. 20, "	1,500	Head-on collision.
1516	Henry C. Brock	569	"	" 16, "	2,000	Boiler explosion.
1518	Robt. W. Ewing	490	Disability	Dec. 3, "	1,500	Locomotor ataxia.
1520	Cornelius C. Daly	441	Death	" 4, "	1,500	Consumption of lungs.
1521	James E. Carter	168	"	Nov. 25, "	500	Rear-end collision.
1522	Elmer R. Noble	225	"	Dec. 7, "	1,000	Collision.
1524	Alonzo T. Baughman	552	"	" 10, "	1,500	Derailng of engine.
1527	Walter A. Osterhout	232	"	Oct. 26, "	1,500	Abscess of brain.
1530	William Lewis	535	Disability	Dec. 1, "	2,000	Amputation of foot.
1531	Geo. E. Sidell	434	Death	Nov. 29, "	1,500	Struck by car.
1534	Ernest A. Flude	127	Disability	" 29, "	500	Amputation of foot.
1537	Ernest W. Burk	444	Death	Dec. 13, "	1,500	Consumption of lungs.
1539	Harry N. Gilbert	285	"	" 13, "	1,500	Typhoid fever and meningitis.
1542	Joseph E. Gahagan	71	"	" 23, "	1,500	Pneumonia.
1	Wm. E. Simmons	667	"	" 25, "	1,500	Collision.
2	Charles Geiler	409	Disability	" 1, "	1,500	Amputation of foot.
4	Roy Renshaw	198	Death	" 24, "	1,500	Typhoid fever.
5	Walter R. Worden	5	Disability	Jan. 12, 1909	1,500	Locomotor ataxia.
6	Richard Durant	498	"	Dec. 15, 1908	1,500	Amputation of hand.
10	Hugh B. Fontaine	726	"	Jan. 12, 1909	1,500	Consumption of lungs.
14	Geo. A. Hepting	159	Death	Dec. 20, 1908	1,500	Run over by engine.
16	Henry Wells	457	"	" 19, "	1,500	Collision.
17	William A. Loos	141	"	" 21, "	1,500	Typhoid fever.
19	Frank H. Marshall	485	"	" 8, "	1,500	Knife wound.
22	E. B. Bonfoey	237	"	Jan. 1, 1909	1,500	Bright's disease.
29	Herman B. Banister	317	Disability	Dec. 16, 1908	1,500	Amputation of foot.
30	Wm. Fagans	72	Death	Jan. 6, 1909	1,500	Bright's disease.
33	Walter W. Allison	75	"	" 4, "	1,500	Heart failure.
35	Chas. E. Peterson	407	"	Dec. 24, 1908	1,500	Melano sarcoma.
37	Gustavaus J. Klineyoung	673	"	Jan. 11, 1909	1,500	Striking bridge.
38	Thomas F. Gallagher	73	"	Dec. 28, 1908	1,500	Pneumonia.
39	Harry F. Shultz	214	"	Jan. 10, 1909	1,500	Run over by train.
41	William B. Whaley	249	Disability	Dec. 23, 1908	1,500	Amputation of hand.
15	Robert A. Ritzey	211	Death	" 9, "	1,500	Bright's disease.
9	J. M. Whittington	602	"	" 18, "	1,000	Peritonitis.
1162	Peter J. Peascod	482	"	July 2, "	1,500	Typhoid fever.
1439	William Hallan	683	"	Oct. 15, "	500	Typhoid fever.
1514	Patty Londress	395	Disability	Feb. 4, 1909	1,000	Paralysis.
2107	Fred Lee	482	Death	Oct. 17, 1906	1,500	Collision.
1541	Earl Reynolds	231	"	Dec. 26, 1908	1,500	Scarlet fever.
1517	Wm. B. Taylor	6	Disability	Feb. 13, 1909	1,000	Consumption of lungs.

Death Claims Paid.

27—A	$40,500.00
2—B	2,000.00
2—C	1,000.00
1—D	2,000.00
32	$45,500.00

Disability Claims Paid.

7—A	$10,500
2—B	2,000
1—C	500
1—D	2,000
11	$15,000

43 death and disability claims paid, aggregating $60,500.00

Pending Claims February 28, 1909.

68 death claims aggregating	**$96,500**
23 disability claims aggregating	**34,500**
Total of 91 claims aggregating	**$131,000**

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Statement of Death and Disability Claims

FILED WITH THE GENERAL SECRETARY AND TREASURER DURING THE MONTH ENDING MARCH 15, 1909.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
114	Chas. K. James	75	Feb. 16, 1909	Disability	Paralysis of left side	$1,000
115	Clarence O. Fry	17	" 16, "	"	Amputation of foot	1,500
116	E. P. Hutton	3	" 17, "	Death	Pneumonia	1,500
117	J. G. Burchell	341	" 19, "	"	Collision	1,500
118	Jas. J. Flynn	1	" 19, "	Disability	Locomotor ataxia	1,500
119	Geo. W. Dukeshier	628	" 19, "	"	Compound fracture of leg	1,000
120	William Beven	407	" 20, "	"	Partial amputation of hand	1,500
121	Edward Burgett	425	" 20, "	"	Paralysis of left limb	1,500
122	Grant Courtney	138	" 20, "	Death	Derailing of engine	1,500
123	Isaac Dunn	224	" 23, "	"	Typhoid fever	1,500
124	Luther H. Nickels	48	" 23, "	"	Collision	1,500
125	Chas. Richards	356	" 23, "	Disability	Skull fractured and sundry injuries	500
126	John P. Ryan	685	" 23, "	"	Aneurism of aorta	1,000
127	William J. Enlow	409	" 23, "	"	Blind in one eye	1,500
128	Chas. H. Aid	304	" 23, "	"	Paralysis of left side	1,500
129	Alex R. Gillian	341	" 24, "	"	Paralysis of legs and arms	1,500
130	Marion J. Perin	437	" 24, "	"	Partial amputation of hand	1,000
131	John W. Ritter	7	" 24, "	Death	Typhoid fever	1,500
132	Clifford Espy	375	" 24, "	Disability	Consumption of lungs	1,500
133	Herchall L. McLendon	247	" 25, "	Death	Falling from engine	1,500
134	John E. Beasley	433	" 25, "	"	Derailing of engine	1,000
135	Jeremiah J. Sullivan	47	" 25, "	"	Collision	1,500
136	Geo. C. Davis	231	" 26, "	"	Collision	1,500
137	Carl O. Bloom	407	Mar. 1, "	"	Boiler explosion	1,500
138	Howard W. Kidd	182	" 1, "	"	Pneumonia	1,500
139	David E. Earnest	446	" 1, "	Disability	Amputation of foot	1,500
140	John F. Schimmin	203	" 2, "	Death	Boiler explosion	1,500
141	Raymond Walsh	143	" 3, "	Disability	Amputation of foot	1,500
142	J. L. McCullough	555	" 3, "	Death	Boiler explosion	1,500
143	John L. Swett	460	" 3, "	"	Malarial fever	1,000
144	John Redmond	75	" 3, "	Disability	Consumption of lungs	1,500
145	John F. Schappell	271	" 4, "	Death	Acute pancreatitis	1,500
146	Wm. F. William	244	" 4, "	"	Pneumonia	2,000
147	I. F. Winterberg	367	" 5, "	Disability	Blind in one eye	1,500
148	J. H. McLang	178	" 5, "	"	Paralysis	1,500
149	James Grace	472	" 6, "	Death	Peritonitis	1,500
150	Joseph H. Brown	215	" 8, "	"	Pneumonia	1,500
151	Joseph E. Lane	140	" 8, "	"	Derailing of engine	1,500
152	Xerxes A. Eckroth	562	" 8, "	"	Typhoid pneumonia	1,500
153	Grant Emery	93	" 9, "	Disability	Amputation of hand	1,500
154	Joseph T. Brady	137	" 9, "	"	Amputation of foot	1,500
155	Chas. F. Gibson	163	" 9, "	"	Amputation of hand	1,500
156	John E. Hunt	284	" 9, "	"	Bright's disease and heart disease	1,500
157	Louis K. Jessup	54	" 9, "	"	Heart trouble	3,000
158	Peter Cain	297	" 9, "	"	Deafness	1,500
159	Curtes Earnest	618	" 9, "	"	Paralysis of spine	1,500
160	Harry A. Place	431	" 9, "	Death	Consumption	1,500
161	David W. Dolamore	96	" 10, "	Disability	Consumption of lungs	1,500
162	Ernest L. Pyetzki	573	" 10, "	"	Paralysis	500
163	Chas. M. Layton	656	" 11, "	Death	Crushed by car	1,500
164	M. W. Smith	203	" 11, "	Disability	Blind in one eye	1,500
165	Chas. Harrison	439	" 11, "	Death		1,500
166	Wm. W. Demasters	616	" 11, "	Disability	Impaired vision	1,500
167	Wm. W. Patrick	156	" 12, "	Death	Pneumonia	1,500
168	Frank A. Hagerty	44	" 12, "	"	Kidney trouble	1,500
169	Moody L. Gately	760	" 12, "	Disability	Amputation of foot	2,000
170	Edward J. Cashman	243	" 13, "	"	Blind in one eye	1,500
171	J. E. Harwell	45	" 13, "	"	Bright's disease	1,500
172	Levi Watkins	199	" 13, "	Death	Pneumonia	1,500
173	Thomas M. Hourigan	41	" 13, "	"	Acute erysipelas	1,500
174	Clifford Corscadden	656	" 15, "	"	Derailing of engine	1,500
175	James C. Ryan	47	" 15, "	"	Nephritis	1,500
176	Thomas J. Nolan	149	" 15, "	Disability	Amputation of foot	1,500

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Statement of Benevolent Claims.

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM JANUARY 31st, 1909, TO FEBRUARY 28th, 1909.

Claim No.	NAMES.	Lodge No.	Amount Carried.	Amount Paid.
944	John Gilbert	614	$ 750	$ 250
966	August Niles	179	500	500
978	Isaie Wood	73	1,500	500
985	Alexander M. Everitt	11	250	250
986	Eugene Moon	410	500	500
996	Thomas R. Smith	620	1,500	1.000
997	Dainel Fogarty	148	1,500	1,500
1031	William L. Mayfield	94	1,500	500
1040	Daniel J. Kirby	287	1,500	1.000
1043	Frank Crawford	116	1,500	500
293	W. J. McDevitt	25	1,500	1,500
1044	Clarence A. Jones	265	1,500	500
1047	Eugene J. Hanson	494	1,000	500
1060	S. J. Johnson	449	1,500	500
1064	Frank Sweeney	659	1,500	500
993	A. P. Cummings	120	500	500
1082	Ernest T. Baldwin	177	1,500	500
1087	Isaac Bellis	169	1,000	500
1095	Harry E. Sargent	531	1,000	500
1097	Edmund W. Rucks	653	1,500	1,500
1100	Henry L. Clark	169	500	500
1101	Karl Steinmann	388	1,500	1,500
1102	Lindsey E. Minor	290	500	500
19	George W. Robbins	288	1,500	500
1108	Charles H. Farrar	15	1,000	500
1113	Elmer H. Williamson	182	500	500
1114	Joshua D. Pedrick	496	500	500
641	Frank L. Newkirk	59	500	500
973	Theodore J. Rohr	212	1,000	500
975	Benjamin B. Burwell	11	500	500
976	Charles Brown	87	750	250
1121	Ferdinand A. Boehm	276	1,500	500
1134	Peter Peterson	68	1,000	500
1136	Henry Cashin	315	750	750
1146	Jesse F. McKinney	314	1,500	1,500
1149	Charles C. Holtgreen	300	750	750
1150	Robert E. Duncan	236	1,500	500
1151	George Kupper	110	750	250
1148	Jesse H. Snyder	241	500	500
1172	George L. Chandler	551	1,500	500
1181	William E. Granger	398	1,500	500
1182	Harry W. Porter	85	1,500	500
1184	Frank L. Tuggle	40	500	500
1194	James H. Reigart	138	1,500	1,500
1197	James D. Fowler	80	1,000	500
1205	James Walsh	379	750	250
1208	William Crawford	40	750	750
1209	Llewellyn A. Cole, Jr.	29	750	750
1214	Thomas Mullin	120	1,500	500
1221	Henry W. Crandall	99	1,500	500
1224	Joseph A. Holland	506	1,000	500
1231	T. P. Bush	24	1,500	1,000
1238	George H. Wixom	314	1,000	1,000
1246	John S. DeLee	740	1,500	500
1247	T. J. Cunningham	8	1,000	500
1249	L. Holmes	8	500	500
1250	Thomas P. Kenney	223	1,500	500
1267	Edward J. McDonald	237	1,500	1,500
1269	Thomas McDermott	228	1,500	500
1270	William Overfield	228	1,500	500
1281	Gustavus Anderson	125	1,500	500
1283	William C. Welch	583	1.500	500
1284	Wm. G. Reynolds	30	1,000	500
1288	Normen James	439	3,000	500
1292	Jacob Schmidt	424	1,500	500

65 claims paid aggregating $41,250.00.

Beneficiary Assessment No. 3.

General Fund Assessment No. 5.

(Series I.)

Office of the Grand Lodge of the B. of L. F. and E.
Peoria, Ill., April 1, 1909.

To all Members of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that Beneficiary Assessment No. 3 for the payment of death and disability claims, General Fund Assessment No. 5 and Local Assessments are now payable and must be paid to the Financial Secretary of your Lodge on or before May 1, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$3 30	$0 25	......
Class D Members	2 20	25	......
Class A Members	1 65	25	......
Class B Members	1 10	25	......
Class C Members	55	25	......

Local Lodge Assessment in such an amount as may be determined by your lodge, but in no case to be less than 25 cents.

Any member failing or declining to make payment, as above provided, will be subject to expulsion from the order, as per Section 170 of the Constitution, said expulsion taking effect May 2, 1909.

Yours fraternally,

W. S. CARTER,
President.

A. H. HAWLEY,
General Secretary and Treasurer.

Notice to Financial Secretaries.

Office of the Grand Lodge, B. of L. F. and E.
Peoria, Ill., April 1, 1909.

To Financial Secretaries of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified to collect Beneficiary Assessment No. 3, and General Fund Assessment No. 5 (now due and payable on or before May 1, 1909), from all beneficiary members on the rolls of your lodge April 30, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$3 30	$0 25	......
Class D Members	2 20	25	......
Class A Members	1 65	25	......
Class B Members	1 10	25	......
Class C Members	55	25	......

You will also collect from all honorary and non-beneficiary members General Fund Assessment No. 5, and from all members Local Lodge Assessment in such an amount as may be determined by your lodge (in no case to be less than 25 cents), and pay same to the Treasurer of your lodge on or before the fifth (5th) day of May, and forward a report to the General Secretary and Treasurer of all expulsions on account of non-payment of assessments, as per Section 170 of the Constitution. Every member admitted to the Beneficiary Department during the month of April will be liable for double the above amount for beneficiary assessment for the month of May, according to class of certificate.

Yours fraternally,

W. S. CARTER,
President,

A. H. HAWLEY,
General Secretary and Treasurer,

THE BRANDING OF MAN

BY ADELBERT CLARK.

Passing on down through the ages,
Cycles of forgotten years,
We are care-worn, tattered sages,
Heavy-hearted, seared with fears;
All because we stood and waited,
Trembling on life's swaying span,
Like dumb cattle, driven, freighted,
Branded by the hand of man.

Man in God's own image, fettered!
Brother of the ox are we,
Thinking that our ways are bettered
On life's vast and stormy sea!
Afraid to venture—for the falling,
So the best of life we miss,
And because we've missed our calling
We must fear the dark abyss.

Life is full of countless sorrow,
Roses blighted ere they're born,
Just because the fair to-morrow
Proves to be a cloudy morn.
Just because our weak flesh cowered
'Neath earth's ruling mortal clan,
And our rights were overpowered
By the branding hand of man.

Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa,

Matters for the Grand President should be addressed to Mrs. Georgie M. Sargent, 2815 Fourteenth street, N. W., Washington, D. C., and that for the Grand Secretary and Treasurer to Mrs. Mary E. DuBois, 1603 First street, Boone, Iowa.

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The Father's Care.

[Written at Grassy Pond, six miles north of Washington, Daviess County, Indiana.]

Would you realize the goodness of the great Jehovah's love?
Would you dwell upon His kindness, drink the depths of Nature's love?
Leave the busy, bustling city, leave the noisy, crowded street,
Seek the woods wherein is beauty; Nature everywhere you meet.

Here we watch the heather growing, here we see the various plants;
Here the honey-suckle twineth, human footstep seldom haunts;
Here a vast expanse of water spans a space both wide and long;
Here the birds, proud of their freedom, trill aloud their merry song.
Here the stately, beauteous lily holds its sway, acknowledged queen
Of the pond wherein its splendor, glistening white as satin's sheen,
Lovely flowers yet seem to dare us to invade their safe retreat—
Should we but approach to gather, swamp at every step we meet.

Ye who doubt the great existence of our Lord, eternal God,
Gaze upon the wond'rous forest where no human ever trod.
Who hath placed this splendid lily in this swamp, contrasting so
With the muddy, slimy water to the lily's wond'rous glow?

Doubt not, man, the great Creator's works are obvious everywhere;
Scoff not at His works and wonders, but in their beauty take a share.
Seek the forest where the hunter seeks his prey with cautious tread;
When you recognize His wonder all scepticism will have fled.

If the lily in seclusion has a friend who watches o'er
All its wants and keeps it growing on and on for evermore,
Does He not for those who trust Him have a care lest harm befall?
Yes, His children—those who trust Him—He will gladly care for all.

—By Mrs. Henry B, Jones, Washington, Indiana.

New Lodges.

Scioto's Helper Lodge 258, organized February 15, 1909, at Chillicothe, Ohio, with six charter members. Organizer, Mrs. Elizabeth Smith, of Lodge 234, Columbus, Ohio.

Granite Lodge 261, organized February 18, 1909, at Cheyenne, Wyoming, with nine charter members. Organizer, Mrs. Emma Smart, of Lodge 86, of Laramie, Wyoming.

Saginaw Lodge 259, organized February 11, 1909, at Saginaw, Mich., with fifteen charter members. Organizer, Mrs. Ada Ragless, of Lodge 10, Elkhart, Indiana.

Sunset Lodge 255, organized January 12, 1909, at Beardstown, Illinois, with sixteen charter members. Organizer, Lillie Pennigton, of Lodge 103, Galesburg, Ill.

* * *

Complete Transfer of Insurance Certificates.

An insurance member desiring to transfer her insurance certificate shall authorize said changes in writing on the back of the insurance certificate held by her in the form provided thereon. Said change or transfer shall be signed by the secretary of the lodge, and to which the secretary shall attach seal of the lodge thereto and be signed by the member desiring the transfer. Such change or transfer shall not be valid, nor have any binding effect until reported by the secretary of the lodge to the Grand Secretary and Treasurer, and by the latter officer recorded on the Grand Register.

It is absolutely essential that blanks in the form provided on back of insurance certificate be correctly filled when change or transfer is desired and attested by the signatures of member desiring the transfer and the secretary of the lodge, and to which the said officer shall attach the seal of the lodge.

There is now on file a certificate that was made out by a member naming her husband as beneficiary. Her husband died and in course of time she married a second time. She had her insurance certificate transferred to her sister, but neglected to sign her name thereto. She died a short time ago, then it was discovered that the policy, although signed by the secretary and seal of lodge attached thereto, was not legal, as it was not attested by her signature.

Where transfers have been made be sure you have complied with the provisions governing changes or transfers in our constitution and by-laws, and have transferred certificates sent to office of Grand Secretary and Treasurer to be recorded.—EDITRESS.

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Ten Largest Lodges in L. S. of B. of L. F. and E.

Below is given the membership of the ten largest lodges of the Ladies Society of the B. of L. F. and E., as reported March 1, 1909:

1.	No. 3, Hazel, Peoria, Ill.	125
2.	No. 142, Empire, Buffalo, N. Y.	121
3.	No. 60, Pride Harrisburg, Pa.	100
4.	No. 151, Missouri, St. Louis, Mo.	89
5.	No. 70, Holly, Buffalo, N, Y.	88
6.	No. 113, Ft. Orange, Albany, N.Y.	83
7.	No. 125, Charity, Jackson, Mich.	78
8.	No. 51, Grayson, Denison, Texas.	76
9.	No. 15, Forest Flower, Cleveland, Ohio	71
10.	No. 91, Mountain City, Altoona, Pa.	69

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Notes.

If one does not care to remain a member of the Ladies Society, there is but one honorable way of severing membership—that is to pay up the dues and ask for a withdrawal card. All really know the right way to do a thing but often forget or neglect to do it.

We learned a few days since of the death of Sister Louie Killion's mother. We are sure that Sister Killion has the loving sympathy of the members of our Order in this sad bereavement,

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A wish for all—
"Health to enjoy the blessings sent
From heaven; a mind unclouded, strong;
A cheerful heart; a wise content;
An honored age; and song."

Have you ever thought how intelligently we have timed our national holidays? On July Fourth, and for weeks before, and after, our thought is love for our common country, when martial music and ringing addresses kindle anew the fires of patriotism. At Thanksgiving we stop long enough to consider our material prosperity and express our gratitude to the bountiful Giver. Then comes Christmas, the glad time, the dear time when all the world shows that it has a heart and is proud of it. And then when the rose light of the Christmas afterglow is dimming, and hearts are slipping back into hiding, and men are hardening up in the daily struggle, and the steady star of peace on earth is forgotten before the flaming star of conquest for position and gold, the Easter time is ushered in, pointing its hope to the hereafter and turning our thoughts from the things that perish with time, to those that may weather eternity. Anyone who will observe these holidays as they come and go is likely to be a vigilant citizen, a faithful steward, a loyal brother, a good man.—Ex.

For time at last sets all things even,
And if we do but watch the hour,
There never yet was human power
Which could evade, if unforgiven,
The patient search and vigil long
Of him who treasures up a wrong.
—Byron.

Our aim should be to catch some portion of a noble aspiration, to follow high ideals, to worship truth wherever found, and so become worthy to carry the banner of enlightenment and intellectual and spiritual liberty in the very front of that procession—the procession of humanity. —Wright.

A man is simple when his chief care is the wish to be what he ought to be; that is, honestly and naturally human. We may compare existence to raw material. What it is, matters less than what is made of it; as the value of a work of art lies in the flowering of a workman's skill. True life is possible in social conditions the most diverse, and with natural gifts the most unequal. It is not fortune or personal advantage, but our turning them to account that constitutes the value of life. Fame adds no more than does length of days, quality is the thing.—Charles Wagner—"The Simple Life."

To be glad of life because it gives you the chance to love and to work and to play and to look up at the stars, to be satisfied with your possessions, but not contented with yourself until you have made the best of them; to despise nothing in the world except falsehood and meanness, and to fear nothing except cowardice; to be governed by your admirations rather than by your disgusts; to covet nothing that is your neighbor's except his kindness of heart and gentleness of manners; to think seldom of your enemies; often of your friends, and every day of Christ; and to spend as much time as you can, with body and with spirit, in God's out-of-doors—these are little guide-posts on the footpath to peace. —Henry Van Dyke.

Respect to old age and kindness to children are among the tests of an amiable disposition. Undeviating civility to those of inferior station and courtesy to all are the emanations of a well educated mind and finely balanced feelings.—Lydia H. Sigourney.

Good breeding is the result of much good nature and a little self-denial for the sake of others, and with a view to obtain the same indulgence from them.—Lord Chesterfield.

Let us learn to be content with what we have. Let us get rid of our false estimates, set up all the higher ideals—a quiet home, vines of our own planting; a few books full of the inspiration of a genius; a few friends worthy of being loved and able to love us in turn, a hundred innocent pleasures that bring no pain or sorrow; a devotion to the right that will never swerve; a simple religion empty of all bigotry, full of trust and hope and love—and to such a philosophy this world will give up all the empty joy it has.—David Swing.

We are all too apt to despise the daily routine of life, the drudgery of the home, the office, school, or counter, at which we spend the best part of each day. We do not realize that life is not lived in the future, but in each day and hour as it comes along. It is the performance of our daily duties that makes up our lives, not the great things which we hope to do in the future, Like a building in course of construction, the everyday deeds are the bricks, small, but necessary, and the greater things are the ornaments, and in a perfect edifice, attractive and steadfast, both are necessary, but the bricks most of all. It is sometimes hard to realize that the commonplace duties are our opportunities of showing our strength, for we like something of greater importance. We do not live just for the time being, but everything is woven into the fabric of our lives. The good and the bad, the petulance, the untidy dress, the despondency and the envy, the unpleasant things taking from the atractiveness of the web.—Montreal Herald.

* * *

Loyal Truths.

Be true!

Be fearless!

Don't start out to be a failure.

"Loyalty to God means liberty for man."

Opportunity is a brilliant which refracts our best colors.—George L. Rees.

God puts consolation only where He has first put pain.—Madame Swetchine.

Who is the happiest of men? He who values the merits of others and in their pleasure takes joy, even as though it were his own.—J. S. Blackie.

All work that is done for the betterment of the world is sure of success. The workers who keep the cheerful front are ever in demand.—Rev. F. W. Murray.

We sleep, but the loom of life never stops; and the pattern which was weaving when the sun went down is weaving when it comes up tomorrow.—H. W. Beecher.

Get into the habit of looking for the silver lining of the cloud and, when you have found it, continue to look at it, rather than to the leaden gray in the middle. It will help you over many hard places.—Selected.

* * *

The Useful Onion.

Every housewife understands that onions are a kind of all-round good medicine without knowing why.

She knows that a red onion eaten at bedtime will, by the next morning, break the severest cold.

She also knows that onions make a good plaster to remove inflammation and hoarseness; but she does not know why.

If any one would take an onion and mash it so as to secure all the juice in it he would have a most remarkable smelling substance that would quiet the most nervous person.

The strength of this substance inhaled for a few minutes will dull the sense of smell and quiet the nerves until sleep is produced from sheer exhaustion. —Exchange.

* * *

A warning against the use of soothing syrups for children was given in the death of the little child a short time ago who could not be awakened from a sleep caused by drinking the contents of a bottle containing soothing syrup. It seemed carelessness to leave it within the reach of the child, but it seems a greater wrong to soothe a child's cries by even a small quantity of a preparation that could be so deadly in its effects when a large quantity is taken. The small amounts must be harmful as well, deadening the delicate nerves of the little one, and weakening them so that in future the child may become an easy prey to the appetite for drugs, either in one form or another. It may seem kindness to relieve the little one of pain by using soothing syrups, but in the long run it may prove cruel, for no one can tell what the ultimate result may be. —Montreal Weekly Herald.

* * *

Value of a Sunny Soul.

This world is too full of sadness and sorrow, misery and sickness; it needs more sunshine; it needs cheerful lives which radiate gladness; it needs encouragers who will lift and not bear down, who will encourage, not discourage. Who can estimate the value of a sunny soul who scatters gladness and good cheer wherever he goes, instead of gloom and sadness? Everybody is attracted to these cheerful faces and sunny lives, and repelled by the gloomy, the morose and the sad. We envy people who radiate cheer wherever they go and fling out gladness from every pore. Money, houses and lands look contemptible beside such a disposition.—Selected.

* * *

Greetings from Autumn Lodge.

The winter just passed has been a notable one for Autumn Lodge in many ways; and one of the first items to chronicle is—that our little town has become a city and we are now hob-nobbing, shoulder to shoulder, with the rest of our city sister lodges. Right proud of it, too, are we, notwithstanding the fact that almost on the eve of the city's birth a large fire swept out a great piece of our business section, leaving a miserable gap and destroying the beauty and neatness of our main thoroughfare that must necessarily last for a few months at least.

Socialy, since our last report, we have held quite a number of pleasant affairs. The first of which, "An Afternoon," with one of our newest, Sister Alice Whitney, who lives some three miles out of the city. It was an ideal day in the late fall and on being received so graciously by the new sister, one and all were delighted with the trip.

Our next attempt was a social given at the home of Sister Nellie Sigsbee, who lives across our pretty river. The night was a glorious one, cold and clear, with a full moon lighting up the frost crystals with an iridescent splendor that touched the hearts of the staid old married couples trudging along until I am prone to believe the most of us saw not the changes time had wrought on each beloved feature, but just the old days when all of us were young; and what a pleasant time we had with our little hostess dispensing such gracious hospitality and all the rest combined made it an evening to be remembered.

The next event was a penny supper, from which we realized almost forty dollars. This was closely followed by a dime supper that netted a neat sum also.

Two new names have been received and we are busily at work with our new drill.

As joy and sadness always seem to be traveling companions, so it was with us; with all of our little pleasures there are always those among us carrying aching hearts. The happy Christmastide found one dear sister, Mrs. Tillie Lape, in the city hospital at Binghamton with only the sad watches of the night to hear her moaning, While our president, Sister Mina Prindle, has again bent to kiss the rod of affliction. Her hands tied already with the care of a dear mother, her husband, Bro. George Prindle, was terribly scalded in a passenger train wreck last September, and all through the long winter has lain helpless on a bed of intense suffering, while on the first week of his injury their oldest daughter was stricken down with typhoid fever. Brother and Sister Prindle have borne their weight of care bravely, and while calling upon them one day of the twentieth week of his bed-ridden days I spoke of it; the sister looked up so hopefully to me and said, "He has helped us." And I thought indeed He has, for "He never sends us sadness, burdens, want or care but that His great love shields us and gives us strength to bear."

But with the passing of the winter Sister Prindle is again able to be with us on meeting day.

During the enforced absence of the president the weight of the work has fallen upon our vice-president, Sister Hattie Bush, who is the mother of three little ones, and so well has she performed her task that she has now the admiration of us all.

In closing Autumn Lodge extends Easter greetings to all Grand Officers, and especially to our beloved Grand President, Sister Georgie M. Sargent, whose heart is so sad just now, to our sister lodges and our dear Editress, Sister Agnes G. Strong, and in translation of the grand old motto "Mizpah" may the Lord watch between me and thee while we are absent one from another.

IMOGENE BATES.

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From Mrs. Stena Ward, Instructor, Mina, Nevada.

Dear Sisters—I hope one of your New Year's resolutions was to attend every meeting held by your lodge or any other within your reach. If you do not intend to do so you are deliberately throwing away one of the many blessings we should eagerly grasp, the association and companionship of good women. Money could not buy from me the many splendid lessons I have learned within the Ladies Society's gates. Every penny, word and deed invested therein always returns with its 100 per cent. interest. Surely none who lends a willing ear escapes the influence of its noble teachings.

Stored with my most cherished recollections are the many words of encouragement and deeds of kindness extended to me by the dear sisters at our last convention and during my travels as instructor here in the truly Golden West.

Our societies are few and far between out here, but they make up in quality what they lack in quantity, and I am very anxious to see one or more of them listed with the "Big Ten" in the near future.

Our president, Sister Culter, is visiting in Nebraska, and on her return I hope to hear No, 117 has renewed activities and is continuing the good work she began so long ago.

For the past year I have lived just 171 miles away from my lodge, and yet on the second and fourth Tuesdays I find myself wishing I could attend lodge meeting for two or three hours—not because I have nothing else to do but because I realize non-attendance is the weak point in so many lodges and every sister should remember when her lodge meets and feel it her duty to be present. There is no easier way to encourage and lighten the burdens of others than by being prompt at every meeting.

* * *

Strengthening the Nerves.

Self-control or nerve force is the great lesson of health, and, therefore, of life itself. To understand how to relax is to understand how to strengthen nerves. Hearty laughter is a source of relaxation, as are also all high thoughts, as those of hope, beauty, trust or love. Relaxation is found in diversion. An occasional outing or holiday is necessary. As there are conscious and unconscious thoughts, there are conscious and unconscious nerve tensions. Women, when shopping, do not know the very tight grip they give their parcels until, on reaching home, their hands fall relaxed in their laps and they say they are so tired.—Health Culture.

* * *

Shine Where You Are.

"Don't waste your time in longing
For bright, impossible things;
Don't sit supinely yearning
For the swiftness of angel wings;
Don't spurn to be a rushlight
Because you are not a star;
But brighten some bit of darkness
By shining just where you are.

"There is need of the tiniest candle,
As well as the garish sun;
The humblest deed is ennobled
When it is worthily done;
You may never be called to brighten
The darkened regions afar;
So fill for the day your mission
By shining just where you are."

I read this little poem in the February issue of the Ladies Home Journal, and somehow it has stayed by me ever since. I never think of the many things I long to do, yet know I can't, but the sweet refrain of this little poem comes to me.

No higher honor or truer distinction has ever been bestowed on any one in this world than the gracious privilege of making others happy, yet how many of us spend our time "supinely yearning for the swiftness of angel wings and spurn to be a rushlight because we can't be a star."

In some of our beautiful western states there grows a flower known as the "Mariposa lily." I have read of it. No spot is too bleak or barren for it to rear its beautiful head; no swamp too dark or poisonous for it to open its innocent eyes and shed its delightful perfume. A number of times since reading of this wonderful flower I have met in the daily walks of my life beings who in my mind's eye I called "Mariposa lilies" in that they are always so fine, gracious and true. Let surroundings be as they may; let petty jealousies and poisonous gossip run riot, they still "brighten their corner of darkness by shining just where they are."

Methinks I hear some sister say, "But how can we be cheerful and 'fill the day with our mission' when we have trouble, sorrow and disappointment?" You surely haven't forgotten Longfellow's beautiful poem entitled "The Rainy Day," have you? Let's see how that last verse reads—

"Be still, sad heart, and cease repining,
Behind the cloud is the sun still shining;
Thy lot is the common lot of all—
Into each life some rain must fall,
Some days must be dark and dreary."

See? We cannot have all sunshiny days. for if we did not have some cloudy days we could not appreciate the bright ones. The one heavenly panacea for all the ills of life is the unselfish devotion to the interests and happiness of others. I heard one sister say. "Oh, well, those for whom we do all this do not appreciate it." Well, now, that is only a small matter, and besides is no affair of ours, anyway.

It is often the case that those who sow the seed must pass away before the harvest time, but that is no sign that there will be no harvest,

I fear some of the sisters will think that I am trying to sermonize. I really do not mean to.

Some changes have taken place in our lodge since I last had a talk with Sister Strong and the other readers of the Magazine. A sad incident on the road, in which Brother Fitzgerald was hurt, made it necessary for him to spend some time in St. Louis. We are very glad to say, however, that he is recovering, and doubtless ere this finds its way into print he will be once more behind the throttle.

Mr. and Mrs. J. E. Harrison of Batesville paid a visit to Little Rock a short time ago. Sister Harrison, we have never ceased to miss you in our meetings and in our loyal hearts you will ever have a "cozy corner" of love.

We are so glad that Sister Shephard, who has been on the sick list, is well again. Also our little friend Willie Perry, who has had a severe attack of appendicitis, is recovering.

With regards and best wishes to you all,

ORA BOONE, Little Rock, Ark.

* * *

Woman's Position Today.

Francis Marion Crawford in his new story, "Cecelia," tells us of a modern Roman maiden. Upon comparing her with our own American girl we find that she is in nature much the same—buoyant, ambitious to be and to do, with ultimately that natural desire to love and to be loved which characterizes the life of every true woman. Her position in the state, however, is very different, and the comparison not so easily made. The right of the American woman is to fill any position, to be a member of any profession; in truth, to go hand in hand with her husband and father and share their part of the burden in the management of the greatest republic the world has ever known. At the same time I believe the natural atmosphere and most sacred vocation for woman is within the home, and so to the relative freedom of a woman so situated and one whose duties lie outside the realm of home-making is far the most.

Freedom and liberty are synonymous terms, and to be free or to be at liberty consists in our being able to act or not to act, according as we choose. There are probably many differences of opinion among even the members of our own circle as to which is most free—according to this definition—a married or an unmarried woman. And one must admit that there are pros and cons on each side. The question whether woman is innately selfish and chooses to do for herself more than to do for others is involved. I do not believe she is. The spirit which characterized the lives of Florence Nightingale and Clara Barton is predominant in the life of every true woman to a greater or less degree.

There is a definition to the word marriage which reads: "The legal union of a man and woman." This brings visions of circuit clerks, transference of property, a justice of the peace, etc. When this is all the result must be too awful to contemplate and the contracting parties slaves indeed.

There is a wider meaning to the word —a union of souls, a unity of purpose, a flowing together of two lives for the greater good of both, the basis of which is love, divine love; and this is the marriage I must speak of in regard to freedom, and without this marriage I do not believe the character of a woman can be fully rounded out and perfected.

I do not mean that success does not attend an unmarried woman. Success in its most exalted degree came to Florence Nightingale and into the battle of life, is a fact which stands out pre-eminently in the current history of our nation.

This condition was not born with the nation, but is the outgrowth of the earnest labors of such women as Lucretia Mott, Elizabeth Cady Stanton, Miss Anthony and others who have stood steadfastly for the equality of sex. I do not think our debt of gratitude to the instigators of the movement for the advancement of woman can be overestimated. I can see no reason why women should not avail themselves of the benefits of this advanced Clara Barton. What might not have been the efforts of their lives had their purpose been sustained by a soul mate?

Queen Elizabeth, of whom it is said that she "rose to the very highest rank of statesmanship and patriotism," was eminently successful in matters of state—and yet she fell into melancholia and died for love of a man whom she had beheaded in a fit of passion. There was a side to her character undeveloped and unsatisfied. In contrast to her, Queen Victoria stands out in bold relief as a true type of wife, mother and queen.

"Woman is born for love, and it is impossible to turn her from seeking after it," so a woman said. If this be true, then marriage is the natural thing and no woman is free without it. I do not forget the endless duties of a housekeeper and a homemaker—the care and weariness of the young mother, the anxiety and solicitude concerning the son or daughter about to go out from the home. All of these are but the price to be paid. The woman who can rise above these things—who is the master and not the slave of her household, is the one who is free.

After all, we create the atmosphere in which we live to a great extent. The late Elizabeth Cady Stanton, of whom a recent biographer said: "She had no intellectual superior among women and few among men," reared seven children to maturity; was a devoted mother and an unsurpassed housekeeper, and yet she, with Miss Anthony, wove the enduring fabric of woman's emancipation in which you and I are clothed.

She was free and at liberty, and so may we all be who follow the direction of the "better self," whether fighting the battle alone or with another.—Ex.

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Don't Whine.

Some one has said: "Whining is poor business; it identifies you at once with the under dog, and does not get you any sympathy at all." The man who whines confesses his weakness—his inability to match his environment. He cannot command the situation; it is too much for him. All he can do is to kick and complain. The whiner never gets anywhere, never accomplishes anything.

The man or woman who uses up vitality in complaining, finding fault with circumstances, kicking against fate; who is always protesting that there is no justice in the world, that merit is not rewarded, that the times are out of joint, and that everything is wrong, is put down rightly as a weakling, with a small, narrow mind. Large-minded men and women do not spend their energies in whining. If they meet an obstruction they go through it and pass on about their business, They know that all their time and strength must be concentrated on the work of making life. The whiner not only wastes his time and strength, but he prejudices people against him. No one feels inclined to help a man who is always complaining of conditions and blaming his "hard luck." Somehow, we get the feeling that he does not deserve help so much as a good scolding.—Ex.

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Letters from Friends.

FROM L. S. 123—(*Elsie Van Hoosen, Alliance, Nebraska,*) The extreme stormy weather has been sufficient reason for all social events to be laid aside, but we trust the spring is not far away, and that with its appearance our joint meetings and other pleasant gatherings will again occur.

We find the most satisfactory method of having our joint meetings is to serve supper at six o'clock or later and to have some form of amusements afterwards. By so doing the children come in for their share of the enjoyment, and no one is suffering with sick headache next day from being up too late.

The ladies have decided upon giving a monthly dance to the general public, each man paying fifty cents at the door, hoping by this means to "swell the funds" of the society.

I wonder if all of the sister lodges have tried the plan of having a "penny march" and birthday offering (if any) at each meeting and using the same to purchase flowers for sick members of the lodge or sick brothers and in death. It surely brings happiness to the givers and receivers, and all share in it willingly.

For the first time in its existence of almost five years the charter of Box Butte is draped in mourning and its members bowed in grief. Sister Goldie Hosier, with her husband and wee daughter Irene, was returning from a pleasant holiday vacation spent in Creston, Iowa, with loved ones and friends, and stopping in Lincoln, Neb., to visit an aunt, was very suddenly taken sick and carried to a hospital January 19, 1909, where it was found necessary to undergo an operation for abscess appendicitis. On Wednesday, January 27th, the operation took place with seemingly favorable results, but Friday morning in the early hours the spirit of our sister passed away.

"There is no death! The stars go down
 To rise upon some fairer shore;
And bright in heaven's jeweled crown
 They shine forever more."

Sister Goldie appeared to be the very embodiment of health and vitality, and we had experienced no uneasiness even when word was received that an operation was inevitable.

Not one of our members would have been more missed and more dearly loved than she. Always a smile for one, a cheery word or one of sympathy for another, and better still, the helping hand and kindly deed and action. Only this winter, when scarlet fever had invaded the home of one of our sisters and the mother too busy with the care of her little ones to have much time or thought for anything in the way of nourishment, did our sister prove herself a "friend indeed," preparing and sending dainties regularly. She carried out so fully a life of usefulness, "doing all the good she could in every way she could and at all times." We may add "a life of happiness" truly was hers, for what surer way is there of obtaining that gift than ministering unto others.

We miss her more than we can tell and mourn our loss, but how glad we are to remember she was ever given to us. May the word of criticism remain unspoken, and in its stead be given the praise due and the warm handclasp, and love melt all coldness and enmity, knowing it was our sister's way and the best way. She was our faithful conductor and Magazine correspondent, and one of our best members, To the husband bereft of his life companion, little Irene of a mother's love and care, and the parents of their only daughter, we extend our sincerest sympathy and love, commending them to Him who has promised: "I will not leave you comfortless, I will come to you." May the Eternal God be their refuge and the everlasting arms around and underneath them in their time of grief and sorrow.

"The meeting place is over yonder,
  Where the weary are at rest;
Let us then go on with patience,
  Tho' by care and grief oppressed.
Swift the wheels of time are turning,
  And the years may not be long
Ere we cross the darksome river
  To the summer land of song.
We shall meet them, we shall greet them,
  When life's toils and cares are o'er;
We shall meet to part, no, never,
  When we reach the other shore."

FROM L. S. 22—(*M. L. Field, Denver, Colo.*) It is with pleasure I can write you that Scenic Route Lodge 22 has taken a new lease on life and is up and doing. We have just admitted four new members, and there are more to follow.

We are to have a new hall in the near future, of which we shall be very proud and will work with a will.

But all has not been happiness with us, and I must tell you of our great loss in the death of Sister Elena M. Smith.

"One by one the frail links part,
Hand drops from hand and heart from
  heart;
One by one the sweet things given
To brighten earth, go back to heaven,"

Death is the grim antagonist of life, and yet we seldom think of it until the shadows fall across our own path, hiding forever from our eyes all traces of our loved ones, whose loving smiles were the sunlight of our existence." Our dear sister has passed through the Dark Valley. The veil has been lifted. She has tasted the fruits of God's blessed promises. She was a good wife, a loving, indulgent mother, kind neighbor, a faithful lodge member; was so patient and self-sacrificing. All who knew her loved her. Oh, that there were more like her! She was an example to follow, a memory to cherish.

"There is no death! The stars go down
  To rise upon some other shore,
And bright in heaven's jeweled crown
  They shine forever more."

Like her, let us ever have a word o cheer, of encouragement to brighten the pathway of those we love. A word of cheer, how it will enter into a life and brighten it. Its path no eye can discern, but it slips in at the ear, finds its way up that mysterious staircase that leads to the viewless mind, lodges itself in the chambers of memory and at each moment of failing courage or a slackening nerve sends a magic spark thrilling through the soul.

Sisters, let us ever have that friendly word of cheer, that sympathizing glance.

"Give the heart's best treasure,
And the more thou spendest
With a double bounty,
God will give the more,"

FROM L. S. 245—(*Lorena Facs, Waseca, Minn.*) Eccentric Lodge was organized September 23, 1908, with twelve charter members, We meet every second Monday afternoon and every fourth Thursday evening in the A. O. U. W. Hall.

We initiated one new member at our last meeting February 8th and expect to have another at our next meeting February 25th.

All of the members are so willing to work and do whatever they can for the good of the Order, and with such members we can't but prosper.

We meet at some one of the members' homes every other Thursday to sew, and each one brings ten cents which goes into our "At Home" fund. Refreshments are served by the hostess. We are making a quilt which we hope to dispose of at a dance and supper after Lent is over.

We have sold one quilt and gave a dance at the same time which proved to be a great success, and thus you see

Eccentric Lodge 245
Is one that surely ought to thrive,
Because they're all so willing to do
Whatever it is you ask them to.
Our class is not so very large,
But she is a dandy, the one who has charge;
And all are satisfied with their places,
You could soon tell that by the looks on their faces.
Our obligation we must remember
When of the L. S. we become a member.
It certainly is a thing we ought to do;
It teaches us to be so true;
And that is the only way to be,
The only way that is clear to me.
The boys of No. 65 B. of L. F, and E.
Have been very good to us, you see;
And we thank them for their aid
In helping us our debts to get paid;
And we hope that there will some time be
A larger class of friendship and charity.
As this is our motto and guide,
To each heart it should be tied,
That we may always keep it in mind
And not forget it and leave it behind.
Our sunshine money must be thought of, too,
And not leave it at home, for that wouldn't do;
For 'tis only a penny to bring each meeting
To drop in the box, and it seems quite a greeting
For a sick member to get a few flowers,
For we know the minutes to them seem hours;
It cheers the heart, it gladdens the mind
To know you have a friend so kind.
So may God bless our Ladies Society
And help them to live more truly their motto Friendship and Charity.

* * *

FROM L. S. 164—(*Mary L. Gast, Columbus, Ohio.*) Wonder if the sisters at large know that there is a Columbus Lodge 164, or do they think we have dropped out of existence or into oblivion just because we had our hands full previous to and during the convention?

We are glad to say we are still in existence, and are thriving as usual. We certainly did have our hands full preparing for the convention. But, oh, my! we really enjoyed every minute of it, and now what pleasant memories of scenes enacted and faces met and what pleasure to look back upon it all now.

Dear sisters, we remember you all with pleasure and would be glad to grasp your hands again.

What is our lodge doing? This is a part of what we are doing—we are organizing a good sized class for initiation in the near future. Then there are flowers for the sick and visits to the sick, and we always try to keep in touch with the Brotherhood boys who are sick or injured.

We have been endeavoring to keep up our social part with the following result: On November 17th we sent an invitation to our own and Franklin Lodge 9, and enjoyed a box social. Cards and dancing were the modes of entertainment and were a success. December 16th we held our first annual ball; had a rousing good time and it proved a financial success. January 23d we held an open session with No. 9. Cards and dancing and a fine supper with plenty of good cheer and altogether a very enthusiastic meeting. February 22d we held a Washington's birthday ball, all coming en costume impersonating Martha and George Washington. Visitors from Lodges 89, 202, 445, 475, 537 and 583. A most enjoyable and excellent affair, a complete success socially, and certainly all heart could wish for financially.

This was a joint affair with No. 9. They ever stand ready and willing to join hands with us at any time for anything and are always loyal to us in all things, for which we are fully appreciative.

March 17th being our first anniversary, we will celebrate the occasion by having the brothers and their families enjoy a banquet with us. This in a measure will be to show them our appreciation for the kindness shown us and for the elegant banquet they served us the evening of our installation.

We have had several secret sessions with the brothers of No. 9 also. Now, do you think we are asleep or have been asleep? Wake up? Well, we sure don't need to.

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FROM L. S. 35—(*Mrs. Ethel McDonald, Tyler, Texas.*) It has been some time since Lone Star Lodge 35 has been heard from through the columns of the Magazine,

We are giving socials at the homes of different members on the second and fourth Thursdays of each month. A free-will offering is taken, and the money given is used to buy fruits and flowers for our sick members; then, too, these meetings create a more social feeling among the members.

On January 21st we were glad to have with us two visiting sisters (we are always glad to welcome visitors into our circle), and after meeting adjourned refreshments were served, consisting of coffee, chocolate, cake and sandwiches.

We have entered into a contest for better attendance, dividing our membership equally, with a captain for each side. The defeated side will be expected to treat the entire lodge.

In response to a request for help from the Railroad Men's Home we sent five dollars.

The stork visited the home of Brother and Sister Major Green and left them a future B. of L. F. and E. member, and one also to Brother and Sister Peacot.

With best wishes for our Editress.

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FROM L. S. 228—(*Sara O. Russell, Roseburg, Ore.*) As it has been some time since anything has been written from Lodge 228 I trust these few items will not be amiss.

We are still gaining in numbers, though not so fast, perhaps, as we would like, and we find so many more who would join us if they could do so socially.

We meet every Thursday afternoon, the second and fourth meeting days being social afternoons, the sisters taking turns entertaining in the alphabetical list of the lodge.

One of the most pleasant events of the season was the six o'clock dinner given January 18th by the sisters for the brothers and families, A large number were present and all did ample justice to the excellent viands set before them. The remainder of the evening was spent in dancing. Among the guests present were Brother and Sister Sharp of Pasco, Wash., former residents of Roseburg, and whom we are always glad to welcome to their old home.

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FROM L. S. 199—(*Violet Stover, Seattle, Wash.*) Just a few lines from Puget Sound sisters No. 199 to let you know we are still actively engaged in the work of the Order.

By our efforts in entertaining we have been able to add to our treasury $131.85 during the past year; thanks due to our faithful sisters and helpful brothers, who are always lending a helping hand to advance the interests of our lodge.

We are making a canvass for new members which we trust will bring profitable results before this year closes.

We hope that those of our sisters who expect to visit our A. Y. P. Exposition this summer will remember that Seattle has a real wide-awake branch of the Ladies Society, and we at this time extend you a cordial welcome to our city and hope the sisters and brothers of the L. S. and B. of L. F. and E, will not leave the city until they give us a call.

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FROM L. S. 135—(*Mrs. Anna Sparks, Roseville, Ore.*) Just a few lines to let the sisters know that Emerald Lodge 135 is still in existence.

We have moved our lodge from Rocklin to Roseville, Cal., a distance of four miles, as the division station has been changed to that place. Before leaving Rocklin we gave a farewell banquet, to which the brothers were invited, and it was voted a very enjoyable affair by every one present.

We gave our annual ball in Roseville on New Year's eve. Nothing was left undone that would make our first ball in our new home one to be remembered. It was a great success both socially and financially.

The joint meetings have been discontinued for some time, as we have had such difficulty in persuading the brothers to attend.

Emerald Lodge meets the first and third Fridays in each month at 2:30 p. m. We have good meetings and serve refreshments at each meeting.

The stork visited the home of our president, Sister La Fond, recently, leaving her a baby girl,

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FROM L. S. 161—(*Bitkiah Pinkney, West Toronto, Canada.*) We are at last waking from our long sleep. Although you have heard nothing from us, we are very much alive.

We have one new member and more in view. We have been living the past year in a "vale of tears." Sisters Evens and Quinn have lost their life companions, Sister Martha Cameron her son and Sister Nellie Quinn her brother. Sister Ritchie's husband at present is very ill and not much hopes entertained for his recovery, while Sister Ritchie is far from well herself. Sister Donaldson's children are also under the doctor's care.

But with all our sorrow we have had cause for happiness also. Sister Lillew's home was brightened by the arrival of a fine young fireman, 'most a year old now.

On January 30th our brothers of No. 262 accepted an invitation to supper served by the sisters of No. 161, the occasion being a class of brothers who were being instructed into the mysteries of the B. of L. F. and E. We have a splendid lot of brothers, and you should see them eat; and so much left. We sold a ham that was left over and received six dollars for it alone, Brother Wark was present and gave us a nice talk on the good of the order.

We have a number of names waiting our committee to call on them, and with the aid of No. 262 we should be one of the "Big Ten."

Queen City Lodge 262 and Maple Leaf Lodge 161 are having an "at home" on February 18th, and we will tell you about that later.

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FROM L. S. 42—(*Grayce F. Lyon, Conneaut, Ohio.*) It has been a long time since you have heard from Success Lodge 42, but please do not think we are not in existence because of that fact, for we are slowly but surely growing.

We initiated Sister Pansy Orford at last meeting and will have more applications to ballot on next meeting.

At the close of lodge meeting January 27th Sisters Wallace, Sharp and Bailey served a very nice luncheon, consisting of coffee, sandwiches and cake, which was greatly enjoyed by all present.

I wish some of the sister lodges would suggest some plan to get members out to lodge with more regularity. There are some of us that are willing and ready to do anything to help the lodge in other ways, yet they do not come out to the meetings. We are hoping that pleasant weather will bring them out.

With best wishes to all sister lodges.

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Death Report.

Elena M. Smith, Lodge 22, died January 20, 1909; cause, intestinal obstructions following operation for tumor. Insurance, $200.

Emma C. Brown Wantling, Lodge 3, died December 29, 1908; cause, apoplexy, Insurance, $200.

Alma Anderson, Lodge 103, died February 1, 1909; cause, heart failure. Insurance, $400.

Margaret E. Safford Gibson, Lodge 189, died February 11, 1909; cause, acute nephritis. Insurance, $400.

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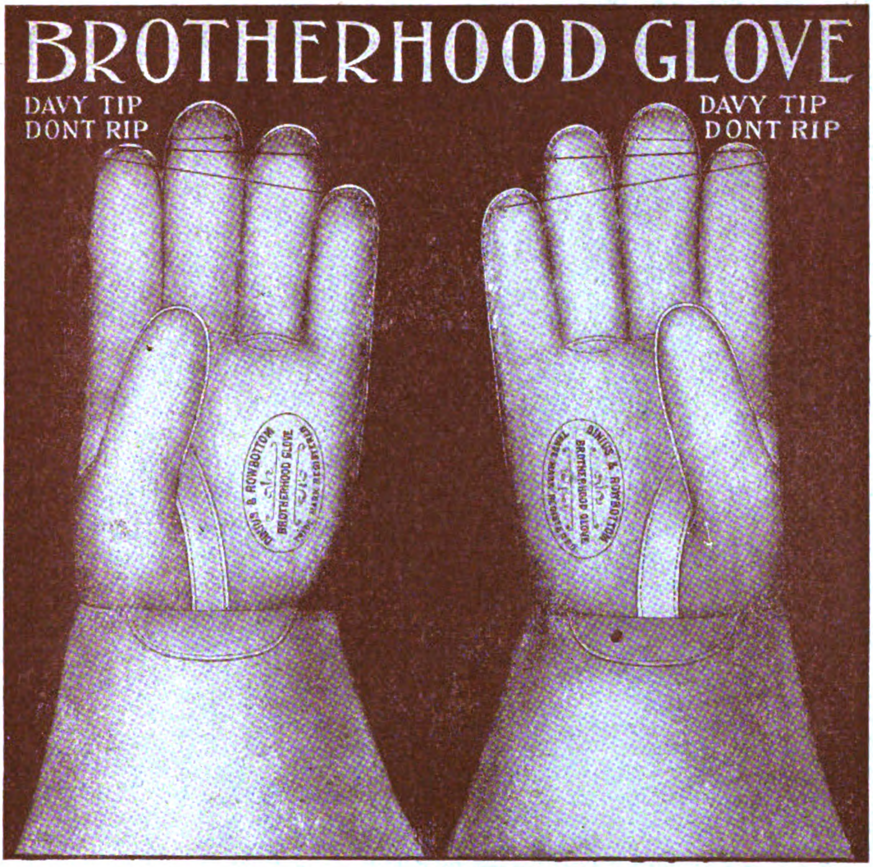

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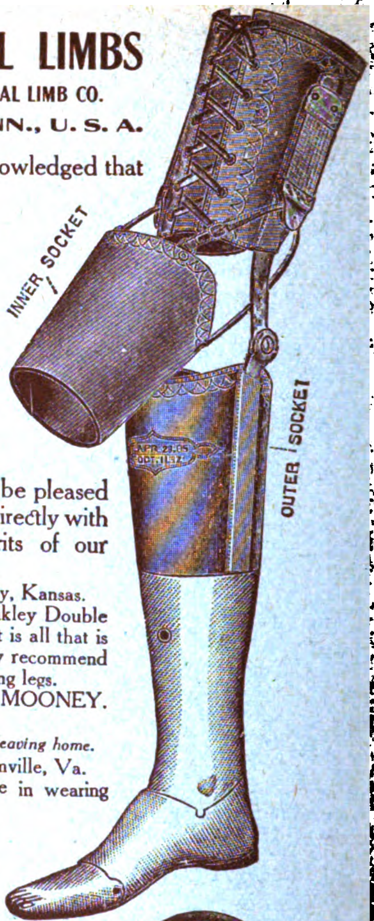
Talk No. 4.

A PRACTICAL TALK ON ARTIFICIAL LIMBS

By LOWELL E. JEPSON, M. S., the President of THE WINKLEY ARTIFICIAL LIMB CO.

Continued from Last Issue. MINNEAPOLIS, MINN., U. S. A.



It is quite generally acknowledged that Railroad Men are above everything else very practical, and that they wish to see and to know for themselves from first hand sources; and this being true, we are glad to refer you directly to Brotherhood Men now wearing our **Double Slip Socket Legs** and in every day active service and we would be pleased to have you communicate directly with them concerning the merits of our limbs.

Peabody, Kansas.

I have worn one of the Winkley Double Slip Socket Legs for years and it is all that is claimed for it and I can heartily recommend it to all Brotherhood Men needing legs.

J. B. MOONEY.

Made from measurements without leaving home.

Farmville, Va.

After twelve years experience in wearing other limbs I am now wearing the Winkley Leg and find the slip socket to be a great advantage and I am very much pleased with the same. I have worn it continuously and have had no trouble whatever. My run averages from 14 to 17 hours a day and if I had to order another leg I would order the Winkley.

C. E. SPENCER,
B. of L. F. Div. 401.

So. Quebec, P. Q., Can.

I have been wearing the Winkley Double Slip Socket Leg for over seven years. My leg is off one and one-half inches below the knee but with the assistance of the double socket I have full knee action. My work is nine miles from home so I always work 24 hours at a time without coming home or taking my leg off and my leg never gives me any trouble and I can conscientiously recommend the Winkley Limb to all Brotherhood Men.

J. C. CONNOLLY, B. of R. T. Lodge 50.

Made from measurements without leaving home.

My artificial leg is simply perfect, and for years upon this leg I fired an engine every day, even during the hottest weather, and was always just as fresh as any of the crew at the end of the run. The Double Slip Socket never chafes the stump. I have since been the County Treasurer and have an easier job, but I will always be pleased to answer any letters of inquiry from Brotherhood railway boys who are in need of limbs.

Yours truly,
J. L. BERRY, No. 320, B. of R. T.

Made from measurements without leaving home.

Somerset, Ky.

I can catch on or get off a train running 15 miles an hour, have been on my leg from 30 to 50 hours at a time, can take water and coal as quick as ever, am running through a mountainous system and you railroad boys know what that means. I ordered a second Winkley Slip Socket Leg after wearing the first one several years.

L. B. GUFFY,
B. of L. F. & B. of L. E.

Continued *in next issue.*

BROTHERHOOD OF Locomotive Firemen and Enginemen's Magazine

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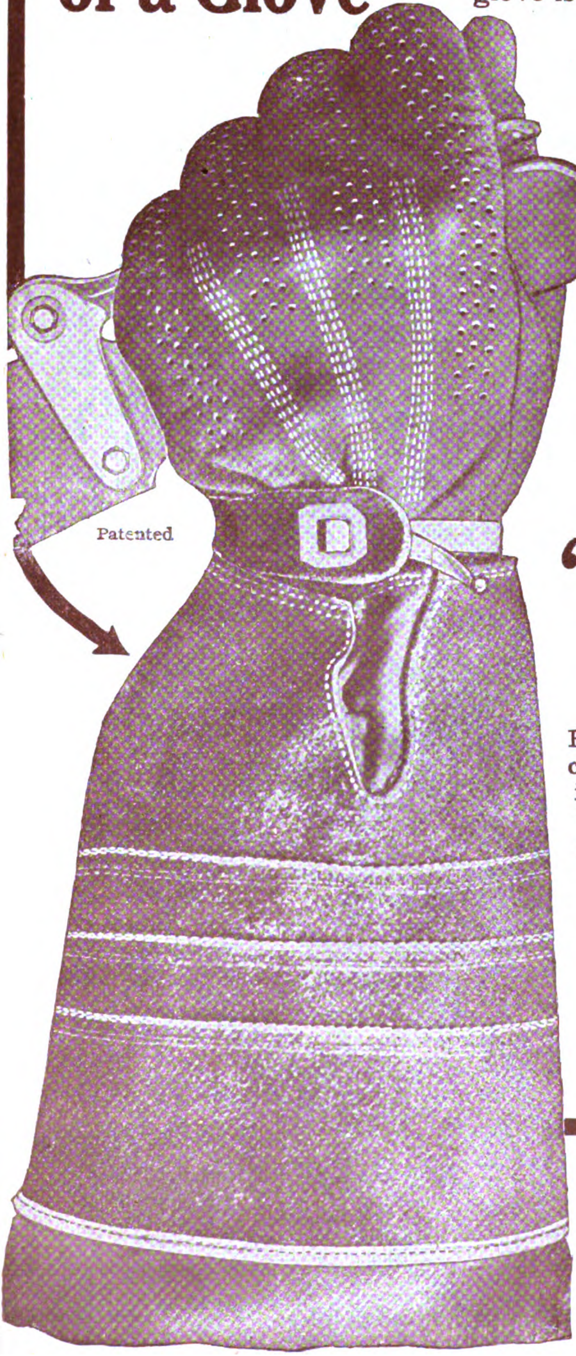

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PRESSURES

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▨ BRAKE CYLINDER
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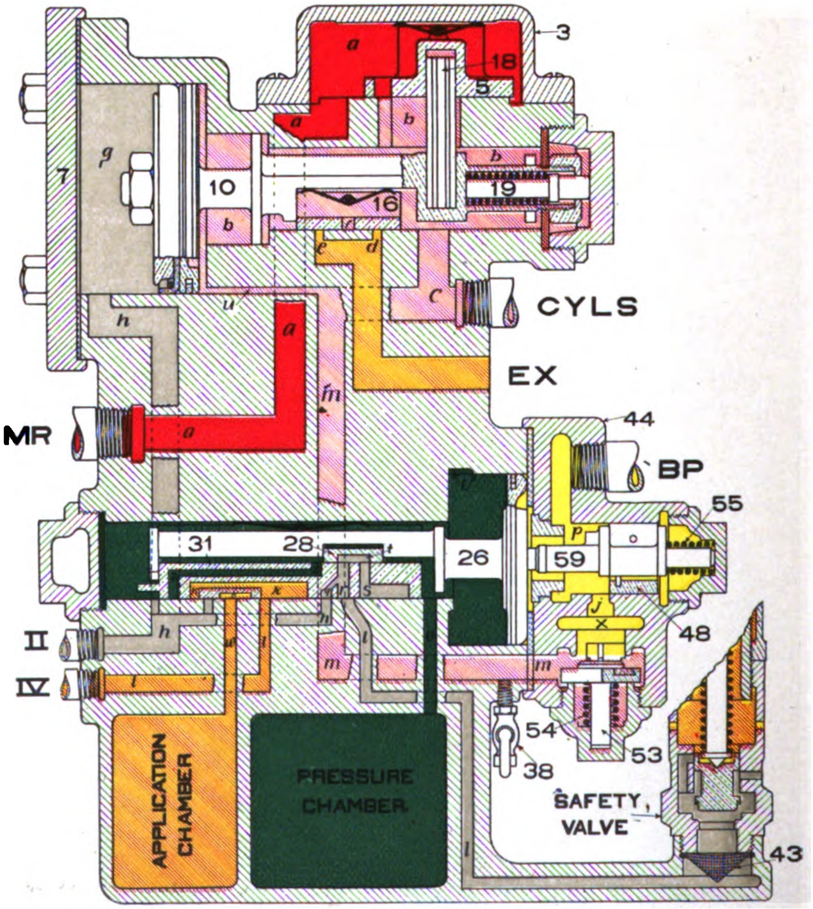
▨ ATMOSPHERIC
□ APPLICATION CHAMBER AND APPLICATION CYLINDER
□ BRAKE PIPE



Locomotive Firemen and Enginemen's Magazine Educational Charts

WESTINGHOUSE AIR BRAKE SERIES

PLATE XLIV—DISTRIBUTING VALVE, WITH QUICK ACTION CYLINDER CAP, No. 6 ET LOCOMOTIVE BRAKE EQUIPMENT (Emergency Position)

BROTHERHOOD OF
Locomotive Firemen
and
Enginemen's Magazine
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

SUBSCRIPTION PRICE
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VOL. 46 NO. 5 INDIANAPOLIS, IND. MAY 1909

Plate XLIV—Distributing Valve, with Quick-Action Cylinder Cap, No. 6 ET Locomotive Brake Equipment (Emergency Position).

Plate XLIV of the Westinghouse Air Brake Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts represents the distributing valve with Quick Action Cylinder Cap, of the No. 6 ET locomotive brake equipment, in Emergency Position. The position of all operative parts as shown will be taken as the result of any emergency reduction of brake-pipe pressure, however made, and—with the exception of check-valve *53*—of service reductions from any source, of more than 20 pounds; the results obtained by the distributing valve itself will be the same at emergency applications, whether made by the automatic brake valve on the same engine or from other points in the train line, but the permanent pressure effects may differ; and, although an overheavy service reduction will cause the equalizing portion and the quick-action slide-valve-and-stem to move to the extreme right, no supplementary results whatever will be obtained thereby from the parts contained in either the quick-action cylinder cap or the distributing valve proper.

Our subject is the sequel to last month's chart that described the same special attachment to the distributing valve in release position; the main portions of the distributing valve are in exactly the same situations as they were shown in the chart (Plate XLI) in the February number—*emergency position*—and the explanation of all parts in that plate will apply to the present one.

A sudden, heavy (emergency), reduction of brake-pipe pressure in chamber *p* permits the pressure-chamber air to force equalizing piston *26* to the extreme right of its travel, during which it strikes stem *59* and further compresses the graduating spring, *55*; the difference from the plain cylinder cap begins now, for an emergency slide-valve is carried between the shoulders of the graduating stem, and the slide valve being moved to the right it uncovers port *j* in the seat through which brake-pipe pressure flows down into chamber *x;* the emergency check-valve, *53*, is in direct connection with the locomotive brake cylinders from its under side, and with no pressure previously existing in that direction, the pressure in chamber *x* unseats the check valve and flows through passage *m* to passage *c* and the brake cylinders, the check valve reseating when the pressure in passage *m* is equal to that remaining in the brake pipe.

Meanwhile, the complete stroke of piston *26* has pulled equalizing slide-valve *31* from over port *h* through which the pressure-chamber air equalizes within the application cylinder, *g*, *only*, at 65 pounds pressure, and piston *10* is forced thereby to the full limit of its stroke to the right, unseating application valve *5* and permitting main reservoir air to flow to chamber *b* and, via passage *c*, to the locomotive brake cylinders until the latter pressure is slightly in excess of that in cylinder *g*, when *emergency lap* position is taken by the application portion and brake-cylinder pressure-supply temporarily ceases.

A supply of brake-cylinder pressure has thus been initiated from two separate sources *almost* simultaneously—but not quite; it will be apparent that the vent of brake-pipe pressure to the brake cylinders begins at the instant the equalizing piston has made its answering stroke to the brake-pipe reduction, while the opening of application valve *5* through which the main reservoir air is received must necessarily come later.

In connection with this improved function of the distributing valve some confusion may exist, and wagers be made and lost, as to the whole result of the vent of brake-pipe pressure. To those familiar with the Westinghouse quick-action triple valve, and the fact that a full service reduction from 70 pounds initial brake-pipe pressure will give a brake-cylinder pressure of 50 pounds, while an emergency application will give 65 pounds where the No. 6 ET distributing valve with quick-action cylinder cap is used, it will easily appear that the increased brake-cylinder pressure at emergency is due to the extra air obtained from the brake pipe; such, however, is not the case, as a similar increase will be noted where the plain, equalizing-cylinder cap is used. Whatever pressure may be obtained in the locomotive brake-cylinders is regulated by, and matched with, the pressure developed in the application cylinder, *g*, of the distributing valve; the 50 pounds at full service application is the pressure-chamber air after it has expanded into the application chamber and application cylinder; at an emergency application, the equalizing slide-valve cuts out—isolates—the *application chamber*, as is plainly shown in the subject plate where that chamber still retains the atmospheric reference-color of orange, and the room for expansion of the actuating pressure is cut down to simply the small application cylinder with which the pressure-chamber air equalizes at 65 pounds; this pressure will rise to 68 pounds, however, when the emergency application is made by the brake valve on the same engine.

Yet, inasmuch as the action of the equalizing valve and the parts of the quick-action cylinder cap is identically the same at emergency as those in the quick-action triple valve, it is hard to comprehend why the additional volume of brake-pipe air does not increase the brake-cylinder pressure above 65 pounds and unseat the safety valve at 68 pounds —which it will not do as the result from hose parting, etc. (the safety valve is shown in the chart to be blowing down the *application-cylinder pressure* with which it is connected, but this only follows when the local brake-valve handle goes to the emergency position, and at heavy applications with the High Speed Brake); and it will be more easily understood if the student will bear in mind that no difference from how many sources, at however high a pressure, the locomotive brake-cylinder-pipe may receive its air supply, whenever that brake-cylinder pressure equals or slightly exceeds that of the application cylinder the main reservoir supply will be cut off by the application valve lapping itself, and if the brake-cylinder pressure should continue to increase from other sources the application piston would recede further to the left, opening its exhaust valve and blowing the brake-cylinder air away in excess of 65 pounds; or 68 pounds, as the result of the *application cylinder* reinforcement of pressure through the "maintaining" feature.

The benefit sought for in the quick-action addition to the distributing valve is primarily the quicker reduction of brake-pipe pressure—chiefly through the venting of that air automatically on all "dead" engines or those secondary in double-heading—at emergency applications; it also effects an economy in air, as the main reservoir is not called on to supply the whole volume of brake-cylinder pressure.

It was stated earlier in this article that there may be some difference in the *maintenance* of locomotive brake-cylinder pressures following emergency applications, as to whether they are made by the automatic brake-valve on the same engine or from another cause—from another engine's brake valve, hose parting, etc.; this was explained in connection with Plate XLI, but it may be repeated that *the maintenance of brake-cylinder pressure against leakage* is wholly dependent upon *the maintenance of application-cylinder pressure;* if the packing in application piston *10* is not effectively tight—for instance—leakage of brake-cylinder pressure will draw the air from the application cylinder past piston *10* without moving it, and the braking power will waste away when no leakage to the atmosphere, direct, exists from the distributing valve or either of the "two little copper pipes" that connect it with the brake valves—*this at any kind of an application,* except when made by placing the handle of the automatic brake-valve of the same engine in the emergency position; in the latter case the maintaining port in the rotary valve of the automatic brake-valve permits main reservoir air to flow through the application-cylinder pipe into the application cylinder, and this would be enough to resupply almost any conceivable leakage that would be permitted to exist from the application cylinder or in its connecting pipes; the maintaining pressure also raises the application-cylinder pressure from its equalizing figure of 65 pounds to that at which the safety valve is set—68 pounds—and the supply is not admitted any faster than the safety valve is able to blow it off.

Each application-position chart of the distributing valve has been followed in the next number by its sequel representing the *lap position* that ensues, but it will not be necessary in connection with this chart, as the quick-action feature is not involved in the execution of lap; if it is desired, however, to pursue this phase of action to its final stage, the student is referred back to Plate XLII in the March number—Emergency Lap Position—as the description of every movement in taking that position will apply with equal correctness when fitted with the quick-action cylinder cap.

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Confusion of Gauges on Australian Railroads.

From a report by John P. Bray, United States consul-general at Sydney, it is learned that no less than five distinct and separate gauges exist among the railroads of that country. Of the 3,909 miles of 5 feet 3-inch gauge Victoria has 3,319 miles and South Australia 590 miles. There is 3,472 miles of 4 feet 8½-inch gauge in New South Wales, 82 miles of 2 feet 6 inch-gauge in Victoria, 23 miles of 2 feet-gauge in Tasmania, while of the 7,176 miles of 3 feet 6-inch gauge, 3,359 miles are in Queensland, 1,289 miles in South Australia, 1,943 miles in West Australia, 439 miles in Tasmania, and 146 miles in Northern Territory. It can well be seen that such a condition leads to many difficulties in interstate traffic, and it is said that there is no immediate prospects of standardizing the gauge even for the trunk lines. There was under construction on June 30, 1908, the following new railroads in Australia: Queensland, 224 miles, and 96 miles authorized; New South Wales, 186 miles, and 391 miles authorized; West Australia, 101 miles.

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Three-Cylinder Atlantic Type Locomotive.

An Atlantic type locomotive of the Great Central Railway, England, is reported to have been fitted with three simple cylinders 15½ inches by 26 inches for experimental purposes, the cylinder arrangement being such that it can easily be changed back to the conventional form should it be desired to do so. It is said that the engine thus far has performed satisfactorily and should it continue to do so the type may become standardized. The steam distribution for the outside cylinders is controlled by balanced slide valves driven by Walschaerts gear, but it is not stated how the valve for the inside cylinder is operated.

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Tests of Canadian Bridge Materials at University of Illinois.

It is reported that the Quebec bridge commission, which was recently appointed by the government of the Dominion of Canada to make plans for a bridge to be constructed over the St. Lawrence River near Quebec, to replace the structure which fell during construction in August, 1907, is to have important and extensive tests made of the strength of riveted joints between nickel steel plates at the laboratory of applied mechanics of the University of Illinois. It is said that over one hundred specimens of riveted joints will be tested to failure, and that while a force of at least one-half million pounds will be required to pull apart some of the largest specimens, it will be necessary to measure the slip of the plates as the rivets yield to ten-thousandths of an inch.

◆ ◆ ◆

*The Block Signal and Train Control Board.**

The committee on investigation of European train control devices and railway signal practice reported as follows:

NOVEMBER 17, 1908.

Block Signal and Train Control Board,
Interstate Commerce Commission,
Washington, D. C.:

Sirs—Your committee, appointed January 31, 1908, to go abroad for the purpose of investigating block-signal systems, railroad signals and practices, and devices for the automatic control of railway trains upon European railways, has the honor to submit herewith its report consisting of the following:

Part I, a narrative account of the trip, showing the persons and places visited and the devices and systems examined.

Part II, detailed reports upon the principal devices or systems examined, as follows:

(1) Raven mechanical trip cab signal, North Eastern Railway of England.

(2) Raven electric cab signal, North Eastern Railway of England.

(3) Bounevialle and Smith cab signal, South Eastern and Chatham Railway of England.

(4) Great Western cab signal, Great Western Railway of England.

(5) "Crocodile" cab signal system of the Northern Railroad of France.

(6) Manual block signaling system.

Part III, appendices and exhibits covering various items of information as follows:

(A) Block signals, various.
(B) Interlocking.
(C) Roadway, track, and structures.
(D) Drawbridge protection.
(E) Equipment.
(F) Fog signaling.
(G) Miscellaneous methods and appliances for the promotion of safety on British railways.
(H) The railway department of the British Board of Trade.

Part I.

The committee left New York on Wednesday, March 4, 1908, on the R. M. S. Majestic of the White Star Line, carrying special passports and circular letters to diplomatic and consular officers of the United States from the State Department, and letters of introduction from the Chairman of the Interstate Commerce Commission to various public officials and general managers of railways in Great Britain and on the Continent. The committee also carried a number of the board's files covering devices submitted for examination, reports upon which were made during the voyage and returned to Washington on arrival at London, which was reached Tuesday, March 11. Quarters were taken at the Grand Hotel, London, and our letters of introduction presented either by mail or in person, the committee being greatly assisted in this matter by Mr. W. H. Boardman, president of the Railway Gazette of London and the Railroad Age Gazette of New York City, to whom we desire to express our thanks for courtesies extended.

On the evening of Wednesday, March 12, we attended a meeting at the Institute of Civil Engineers at which Sir William H. Preece gave a paper before the Institution of Electrical Engineers on "America revisited," covering the progress of electric science in America since the seventies, considerable attention being given to the electrification and signaling of the electric zone of the New York Central and Hudson River Railroad and the subway of the Interborough Rapid Transit Company of New York City.

On the evening of March 13 we met Mr. J. F. A. Aspinall, general manager of the Lancashire and Yorkshire Railroad, who furnished us with considerable information in regard to the conditions necessary to be met in English railway signaling practice.

On March 14 we had an interview with Richard Bell, M. P., general secretary of the Amalgamated Society of Railroad Servants, in reference to the work of the trade unions on British railways.

On Monday, March 16, we met Messrs. Bounevialle and Smith, proprietors of cab-signal device being tested on a branch of the South Eastern and Chatham Railway, and arranged with them and with the general manager of that line for an examination of the devices. In the afternoon we called, with Mr. W. H. Boardman, upon Lieut. Col. H. A. Yorke, chief inspector of the railway department of the Board of Trade. That evening we went to York headquarters of the North Eastern Railway, via East Coast route, and on arrival went to the residence of Mr. Phillip Burtt, deputy general manager of the North Eastern Railway, and spent two hours talking with him on English railroad practice, especially block signaling.

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*Extracts from first annual report of the Block Signal and Train Control Board to the Interstate Commerce Commission, dated November 20, 1908.—Continued from April, 1909, Magazine.

On Tuesday, March 17, we met Mr. Alexander Wilson, assistant to the general manager of the North Eastern Railway; Mr. Hurst, signal engineer of the southern district; Mr. James Pigg, electrical officer of the locomotive department, the latter being associated with Mr. Raven, the assistant mechanical superintendent, in the development of the Raven cab signal. We later met Mr. Burtt, Mr. Cudworth, chief engineer, and Mr. Harper, divisional superintendent, and left with them on a special train with inspection car and ran to Alne, a few miles north of York, and examined the installation of the electro-gas automatic block signals covering the 10½ miles of double track from Alne to Thirsk. This installation of automatic block signals, manufactured by the Hall Signal Company in the United States, is equipped with the earlier type of the Raven cab signal, which consists of a mechanical trip operated by wire connection from each distant signal, the trip being moved whenever the distant signal is in the caution position into such relation as to engage the handle of an air whistle valve on the locomotive, should the locomotive pass the distant signal while it is in the caution position. (For detail description see Part II, sec. 1.) After leaving the automatic block territory at Thirsk, we continued northward, passing through Darlington, where we saw on the station platform one of the first of the Stephenson locomotives, and another of a later though very old type. Soon after leaving the station we crossed the old line of the Stockton and Darlington, the first regular railroad in Great Britain.

The Raven electric cab signal is installed on the North Eastern Railway at points between Durham and Newcastle. A description of this system, as given in Mr. Pigg's paper before the Institution of Electrical Engineers, London, December, 1907, is the subject of an article in the Railroad Gazette, New York, of February 21, 1908, and is also described in Part II, section 1, of this report. We arrived at the Central Station at Newcastle-on-Tyne about 3:30 p. m., entering the city over the new King Edward bridge, opened about eighteen months before to enable the North Eastern to run its trains for the north through the Central Station without turning them or having to back them out. The junctions at both ends of the bridge and the terminal trackage itself are equipped with recently built interlocking plants of the Westinghouse electro-pneumatic type installed by Mackenzie and Holland. (For further description see Part III, Sec. B, interlocking.) Later in the afternoon we were taken over most of the new electric suburban line of the North Eastern Railway from Newcastle Central to Tynemouth and back nearly to the starting point, the line being in the shape of a horseshoe, which is soon to be made into a complete loop about 20 miles long.

We left Newcastle Central Station shortly after 9 a. m. on March 18 with Mr. Hall of the minerals department of the North Eastern Railway, and went by rail to Tyne Dock, the company's largest coal-shipping point and one of the largest in the world. The junction near the docks is controlled by an electro-pneumatic interlocking plant. The whole trackage at Tyne Dock is operated on the gravity principle, and we understand that this has been the case since 1859. We returned to York on an early afternoon train leaving Newcastle-on-Tyne and were met there by Messrs. Harper and Hurst with a special, and were taken to Selby, and from there back to Naburn to examine the North Eastern Railway's system of drawbridge protection. (See Part III, Section D.) We returned to York on the special in time to take the 6:50 p. m. train for London, arriving at Kings Cross a little before 11 o'clock.

On March 19, through the courtesy of Mr. W. H. Boardman, we met at the St. Stephen's Club Mr. John P. O'Donnell, a consulting engineer of London, formerly connected with a number of companies engaged in the manufacture of signaling systems and exceedingly well acquainted with all British signal practice. Mr. O'Donnell gave us a very enlightening talk and a number of useful suggestions as to features to be studied.

On March 20 we met Mr. J. W. Jacomb-Hood, chief engineer, and Mr. Arthur H. Johnson, signal and telegraph superintendent of the London and South Western Railway, at Waterloo station, and spent an hour with them looking over the large mechanical interlocking plant at that terminal. (See Part III, Section B.) At 10 a. m. we left on a special with Messrs. Jacomb-Hood, Johnson, and West, of the railway; Mr. Irving, of the British Pneumatic Signal Company; and Colonel Yorke, chief inspector of the Board of Trade. We ran to Basingstoke, stopping at various points to examine typical manual block towers, a very fine installation of automatic block signals of the low-pressure pneumatic diaphragm type, and some low-pressure pneumatic interlocking plants, in which latter track circuit route locking was used together with a system of slotting of signals using replacer levers. About 20 miles of four-track line on this portion of the road is equipped with the low-pressure pneumatic automatic block, the signals and track being maintained in most excellent condition. On our return we stopped at the engineer department shops to look at some experiments being made on a miniature track to obtain data regarding the derailment of trains. We also examined a new type of power switch and lock movement and electric interlocking machine devised by Mr. Arthur H. Johnson. (See part III, Section B.) On our return to Waterloo Station we went out in the yard again to see the fog-signal repeaters devised by Mr. Johnson, which are of the miniature semaphore type, their chief characteristic being that each instrument is placed in a glass bath and submerged in refined petroleum, so that the apparatus always works in oil, providing very efficient insulation as well as lubrication.

On March 21 we called by appointment on Mr. Alexander Ross, chief engineer of the Great Northern Railway, at Kings Cross Station, and received from him an account of some experiments which he conducted with the magnetic cab-signal device designed by Mr. Wilfred S. Boult. After luncheon we took a train from Charing Cross Station to Beckenham Junction, where we met Messrs. Bounevialle and Smith, also Mr. Goodyear, traffic inspector of the road. With them and some other gentlemen we went up a branch called the Norwood Loop Line and back, riding on the engine to watch the operation of the Bounevialle and Smith cab signal. We got off the train at Penge Junction signal box to photograph and examine the ramp and other apparatus connected with this system, which is fully described in the Electrician, London, December 29, 1907. (See Part II, Section 3.)

On Monday, March 23, we called on Mr. Inglis, general manager of the Great Western Railway, at Paddington Station, at an early hour, going by one of the new tube railways so as to observe the traffic conditions in the rush hours. We arranged with Mr. Inglis for a trip over his road on Wednesday. Later in the day we called upon Colonel Yorke, of the Board of Trade, and met his colleagues, Colonel Druitt and Major Pringle. In the afternoon we called on Mr. Willox, chief engineer of the Metropolitan Railway, who, with Mr. Lyons, of the traffic department of that road, took us to Praed Street Station, where we walked through a portion of the underground railroad, going later to the Edgware Road Station to observe the operation of the Sykes automatic block system, using motor signals having treadle and detector-bar control without use of track circuit. This road, which is electrified, uses, in common with most English electric railways, a separate rail for the negative return as well as a third-rail positive feeder, on account of the Board of Trade requirement limiting the permissible drop to ten volts where the running rails are used as a return circuit, this provision being established by the Board of Trade to insure against electrolysis of water and gaspipes, etc., by the return current from electric roads.

On March 24, Mr. Wilfred S. Boult called at our hotel and explained his improved type of magnetic cab signal. In the afternoon we went to Euston Station by appointment to meet Mr. Robert Turnbull, superintendent of the line of the London and North Western Railway, but as he had been unavoidably called away, we were met by Mr. H. H. Neale, and a trip over that road was arranged for Thursday, April 2.

On March 25 we went to Paddington Station and met Mr. Hart and Mr. Dunster, of the Great Western Railway, leaving with them on a special carriage attached to the 10:20 a. m. train for Oxford. At Reading we were joined by Mr. Blackall, the signal engineer and Mr. Jacobs, assistant signal engineer of that road. At Oxford our carriage was cut off and an engine attached to it to take us over the Fairford branch, on which we made an examination and some tests of the Great Western cab signal, also looking into the working of the electric train staff system in use on this single-track line. (For a description of the Great Western cab signal see Part II, section 4.)

On March 26 we met Mr. Harold G. Brown, chief engineer of the Mackenzie, Holland and Westinghouse Power Signal Company (Limited), who gave us a very interesting account of British signal practice, especially as regards the use of the track circuit. (See Part III, Section A.) At 8:40 p. m. we took a special train for Harwich over the Great Eastern from Liverpool Station and from Harwich took the steamer Cambridge for Antwerp.

On March 27 we arrived at Antwerp, Belgium, about 9 a. m., and after passing the customs went from the Quai Sud to the Gare Central. We called upon the station master there, who had us shown about the station, which is one of the finest railroad buildings in the world from an architectural standpoint. We visited the interlocking plant at the terminal, which is of the Siemens & Halske type and which was undergoing extensive revisions on account of track changes. We left for Brussels at 11:31, arriving at the Gare du Nord, and transferred across the city to the Gare du Midi. From there we went to the office of Mr. Weissenbruch, secretary of the Permanent Commission of the International Railway Congress. After a short talk with him in regard to the signaling on the Belgian State railways, we went with Mr. Seaut, one of the State railway engineers, by train to Dieghem, where new safety devices are tried experimentally on a portion of the double-track main line. We saw an installation of a contact rail-cab signal designed by Vital Cesar; also a form of mechanically operated torpedo placer. On this portion of the Belgian State railway line the Siemens & Halske controlled manual block system is in use, as well as a considerable amount of new mechanical signal apparatus, designed in accordance with the recently adopted standards of the Belgian State railways. We noted that while the official correspondence of the Belgian State railways was conducted in French, which language was also spoken by practically all the officers, the instructions to the working force are all printed in Flemish, a large proportion of the employes not speaking French. Notices to the public are frequently printed in both languages. We returned to Brussels by train, and took the 6:15 p. m. express to Paris, arriving at the Gare du Nord, Paris, about 10:45 p. m.

On Saturday, March 28, we called on M. Sartiaux, general manager of the Chemin de Fer du Nord France, and later accompanied M. Moutier, assistant in charge of the technical service, went by train to La Plaine, where, in cabin No. 11, we saw a type of power interlocking machine known as the "auto combinateur," in which instead of using a separate lever for each switch or signal a separate lever is used for each route. (See Part III, section b.)

On Monday, March 30, we left the Gare du Nord at 9:15 a. m. on a special, accompanied by M. Moutier, running to Ermont Eaux-bonnes, stopping at some of the new track and signal installations on the way. The interlocking machine at Ermont Eaux-bonnes is a combination function lever and route-lever machine manufactured by the British Pneumatic Signal Company, and, in addition to the levers for controlling the interlocking functions, it contains separate levers for controlling manually operated disk signals for spacing trains and protection of the station, these latter levers not being interlocked with any others in the machine. We here examined also a typical installation of the "Crocodile" cab-signal system, which is standard on the Chemin de Fer du Nord. About two thousand installations of this cab-signal system are in use on this road and have been for from fifteen to twenty years. It is more fully described in Part II, section 5, though it may be here mentioned that these installations are constructed entirely on the open-circuit principle, an arrangement which would, of course, not be tolerated in this country, nor by the British Board of Trade. We examined two types of torpedo machines, both of which were of the single-shot type, and operated directly from the home signals at interlocking plants. One type was used where through movements only were made, and the other type was used where switching movements were made, being so arranged that the detonator would not be exploded by a train making a reverse movement. In the afternoon Mr. Adams visited the Paris, Lyons, and Mediterranean Station to learn about the interest of the P. L. & M. in the

Great Western cab signal, but the officers who had the information were not at home. Captain Ames accompanied M. Moutier to visit some of the terminal yards and the tracks and signals just outside the Gare du Nord. We left Paris on the 4 o'clock express for Boulogne, taking turns riding on the locomotive for the entire distance, and having a good opportunity to observe the French signaling in operation, both by daylight and under night conditions. From Boulogne we crossed to Folkestone on the steamer *Queen*, a 22-knot turbine boat, and took the South Eastern and Chatham train for London, arriving about midnight. We were shown every courtesy by the officers of the Chemin de Fer du Nord, and received from them a considerable amount of data regarding the signal systems in use on their lines.

On Tuesday, March 31, an interview was had at London with Mr. Wilfred S. Boult, and an examination of portions of his magnetic cab-signaling apparatus was made. A great deal of mail that had accumulated during our absence on the Continent was attended to. That evening we entertained at dinner a number of railroad officers and others who had furnished us with valuable information and had extended courtesies during out visit.

On April 1 a visit was made to the St. James Park Station of the district railway with Mr. Harold G. Brown and Mr. Peter, signal engineer of the road, where a train-announcing apparatus was installed. Thence we went by train to the Mansion House Station, where an electro-pneumatic interlocking plant of recent design was examined. In the afternoon we called on Mr. H. Lewellyn Smith, secretary of the Board of Trade, but on account of his being suddenly called to the House of Commons were met by Mr. Marwood, his assistant, and furnished with considerable information regarding the work of the railway department of the Board of Trade in connection with railway operation in general and safety appliances in particular.

On April 2 we left London on an early morning train over the London and North Western Railway, arriving at Crewe a little before noon. We were met by Mr. H. H. Neale and Mr. Parsons and were shown over the two larger interlocking plants at that station. These are of the "Crewe" type as designed by Mr. Thompson of the London and North Western and manufactured completely in the signal-department shops of the railway. In the afternoon we took a special train to Bentley and Trine Hill, and spent one or two hours in studying the working of the ordinary manual-block system in use on that line. (See Part II, section 6.) We also saw some of the London and North Western type of mechanical torpedo machines adapted for use on a four-track railroad. We returned to Crewe, and from there took the West Coast Scotch Express for Glasgow. Through the courtesy of the superintendent of the line and the mechanical superintendent Captain Ames was permitted to ride the locomotive from Crewe to Carlisle, 143 miles, over the Shap Summit, having an opportunity to thus observe the operation of the signals by daylight and dark. In going up Shap Summit we saw the first installation of "catch points" which we had seen, these being normally open derailing switches placed on heavy upgrade tracks for the purpose of derailing any cars that might become detached from a train going up the hill. Such devices are, of course, more necessary on European railroads than in America, for the reason that so large a percentage of our freight trains use continuous brakes, whereas practically none of the British goods trains are so equipped. We arrived in Glasgow about 10:30 p.m.

On April 3, after visiting the Caledonian railway offices in Glasgow, we met Mr. R. McClellan, assistant engineer of new works, who showed us over the Glasgow General Station. A new electro-pneumatic interlocking plant was in process of installation to handle the track layout for the station yard and crossovers on the approaches thereto, which lie almost entirely upon bridges over the Clyde. This interlocking machine is the largest power machine installed in the world to date, comprising 374 spaces. Mr. Adams called at the office of the superintendent of telegraph of the Caledonian and the method of block working by using the Tyer tablet system was explained to him. We left for Liverpool at 2 p.m., arriving about 7:30 p.m., where Captain Ames spent the evening at the Edgehill yard of the London and North Western Railway with Mr. Rogers of that line.

On Saturday morning, April 4, we called upon Mr. Tyler, assistant district superintendent of the Lancashire and Yorkshire Railway at Liverpool, meeting also Mr. Hauxwell and taking an electric train out over the Southport Electric Line as far as the power house, where a short stop was made. We returned on a suburban train to an intermediate point where we were met by Mr. Byles, signal engineer of the Lancashire and Yorkshire, who showed us some 600 volt solenoid operated full-sized semaphore signals at Sandhill controlled by treadle bars and used as semi-automatic block signals. Upon returning to Liverpool we took a special train (steam) to Lockstock Junction Box No. 1 and examined some signal movement recording machines being tried at that point. By means of these devices a record is made upon a paper tape of the time and character of all signal movements at that plant. We returned to Lime Street Station in the afternoon and went aboard the Cunard steamship Lusitania, which sailed that evening, and we arrived in New York, Friday, April 10.

Part II.

General.—This part of the report covers the manual block system as worked on most British railroads, and certain installations, more or less experimental, of cab signals seen in operation by the committee. Numerous devices for the display of signals on the engine cab have been invented in Great Britain and on the Continent, and a part of them have been experimentally tried, but the only ones in actual use in Great Britain at the time of the committee's visit, so far as known, are those described in this portion of the report, namely, the Raven mechanical cab signal and the Raven electric cab signal on the North Eastern Railway, the Bounevialle and Smith cab signal on the South Eastern and Chatham Railway, and the cab signal being tried on the Great Western Railway. The only installation of this character on the Continent of which the committee had knowledge and believed worthy of examination is the so-called Crocodile cab signal system in use on the Chemin de Fer du Nord, France.

In considering the various cab signal devices that have been tried on the European, and especially British railroads, it is important to bear in mind the operating conditions which have led the railways to undertake experiments with such devices to a far greater extent than has ever been done in the United States. It is safe to say that the primary cause of the interest in cab signaling in Great Britain is fog. Few persons who have not experienced the dense fogs which are encountered in England during the winter months can appreciate their density (in many cases largely increased by soft coal smoke) nor the extent to which their prevalence interferes with business, especially railroad transportation. It is perhaps sufficient to state that on one railroad in England as high as £5,000 has been paid out in extra fogmen's wages alone in three weeks. The general manager of the Lancashire and Yorkshire, which carries the densest freight traffic in England, stated that there were times every winter when every goods train on his road had to go in on a side track and remain there for as much as eight days solely on account of the density of the fog. The fog often continues so long that no attempt is made to operate more than the passenger trains; and those are run with great difficulty and at greatly reduced speed. On some roads having a large suburban passenger service, notably the Great Eastern Railway, a special fog time-table is printed and posted, and goes into effect immediately upon the occurrence of fog.

The above-described conditions will be seen to afford ample reason for British railroads paying very considerable attention to any methods or devices that will overcome the difficulty of operating railroads at times when the fixed signals along the roadway are obscured by fog or snow. It must be remembered, too, that practically every mile of main track in England is block signaled, and that on many of the lines the traffic is very dense, requiring the use of very short blocks, so that fixed signals are much more frequent on British roads than is generally the case in America. Furthermore, the movement of trains on British railroads is controlled entirely by the indications of the fixed signals. Except in cases of serious accidents or obstructions flagging is hardly practiced at all, each train depending wholly upon the fixed signals for protection against following trains. While the English roads have shown considerable interest in the development of cab signals as being the means most likely to insure the display of a proper indication to the enginemen when the view of the fixed signals is obscured, they have given very little consideration to the question of automatic train control. The reason for this is that most British railroad officials believe that their enginemen are so thoroughly trained and so competent and reliable that all they require for the proper control of their trains is the necessary instructions or information in the form of a signal indication: and that any means whereby the control of the train movement is taken out of the hands of the enginemen is not only unnecessary but undesirable. (For description of fog-signaling apparatus and methods see Part III, sec. F.)

1. RAVEN MECHANICAL TRIP CAB SIGNAL.

The earliest and simplest type of cab signal to be used on British railways to any extent is the mechanical trip device designed by Mr. Raven, assistant mechanical superintendent of the North Eastern Railway, and installed on a considerable portion of that company's line.

The system comprises an air whistle on the engine, the valve for which is provided with a handle so arranged on the vehicle with respect to the track as to engage a T-shaped mechanical trip pivotally mounted on a shaft extending between the ties and under the rails when this trip is raised by the rotation of the shaft into position to engage the handle and open the valve on the engine. The trip device is, in common with all British cab signals, used only in connection with the distant signal, it being the theory of English fog-signaling practice that the audible indication should be given at the distant signal in order that ample distance may be allowed to enable the train to come to a stop at the home signal after having received the warning indication at the distant signal.

The principal mechanical feature of Mr. Raven's trip device is that the trip is not rigidly held in operative or tripping position by solid connections through the signal in connection with which it operates, but is counterweighted toward the operative position and operates the handle of the engine valve not by being rigidly held, but through the valve handle not being held strongly enough in its closed position to overcome the inertia of the ground trip which to a certain extent is actually moved or depressed by engagement with the valve handle.

While this form of trip is commonly used with the ordinary manual block signals, it is also employed in connection with one of the few automatic block-signal installations in Great Britain, namely, the installation of the Hall electro-gas normal danger automatic block signals on the 10½ miles of double track between Alne and Thirsk on the North Eastern Railway. In this installation iron chutes, somewhat in the nature of a battery chute, are used to contain the counterweight which is connected by a flexible cable in such a manner as to hold the trip normally in operative position, the trip being drawn down to the inoperative position by means of a continuation of the cable referred to which passes over a sheave or pulley in the base of the signal mechanism case and connects to a lever which is directly operated by the up and down rod of the distant arm of the signal.

The valve handle above referred to as forming a part of the engine device is not acted upon directly by the mechanical trip but is operated by a vertical rod connected to a special striking piece which, through the medium of the vertical rod and bell cranks, operates the whistle valve, an arrangement also being provided to cause the whistle to blow continuously if the striking piece is carried away by the impact of engagement with the ground trip or through any other cause. The method of operation of the ground trip through the medium of a slotted segment worked by a shaft which is rotated by the pull of the wire cable constitutes an ingenious method of taking care of the shock due to the impact of the parts.

Since this device was put into service regular fogmen have not been employed at distant signals in the territory covered by the installation. The North Eastern Railway is, however, not installing any more of these devices, for the reason that the Board of Trade now insists that all cab signals shall give a positive clear indication as well as a caution indication, in order that any derangement of the apparatus which would tend to cause a failure to display a caution indication shall be detected by the absence of the display of the clear or proceed indication.

While the Raven mechanical trip cab signal has been in use over a considerable mileage of the North Eastern for over three years, it is felt not to have had a very severe test under fast-moving traffic for the reason that as the trip operates only when a signal is passed while in the caution position a very small percentage of the actual train movements require the movement of the trip. No further installations of this device are being made by the North Eastern Railway, though that company is experimenting with Mr. Raven's electric cab signal. The signal engineer of the road stated that one man on the division spent all his time in the maintenance and adjustment of these devices.

2. RAVEN ELECTRIC CAB SIGNAL.

The Raven electric cab signal as installed between Durham and Newcastle on the North Eastern Railway on about 14 miles of track has been fully described in a paper read by Mr. J. Pigg before the Institution of Electrical Engineers, London, December, 1907. A very complete synopsis of Mr. Pigg's paper, with descriptions and illustrations, appeared in the Railroad Gazette of February 21, 1908.

It is a cab signal system in which, through the medium of circuit controllers operated in connection with the fixed signals along the roadway, current is suppiled to various contact rails located along the roadway and collected by brushes or other collectors mounted on the engine and used to actuate a signaling device in the locomotive cab. In this system an audible warning is intended to be given whenever a train approaches a signaling point, irrespective of whether the route is clear or not, this audible indication being intended primarily as a marker of location. If the way is clear and the signals governing the block or route are pulled off the warning indication is only momentary, but if the signals are not clear the audible warning continues and visible indications of the fact are displayed on the indicator in the cab. The system provides for the installation, if desired, of additional contact bars between the first warning point and the signal, so that the enginemen may, by counting the number of warning impulses given by the bell, know the location of his train with respect to the next signaling point ahead. In addition to the long contact rails or ramps from which current is collected by brushes suspended beneath the engine, the ramps being located in the center of the track, there are additional short contacts in the form of long, thin springs intended to engage a rotary switch mounted on an arm secured to the forward portion of the engine frame. This rotary switch is contained in a small wheel, and rotation of the switch for making or breaking the proper circuit is accomplished by the rolling of this wheel upon these contact springs. The system is adaptable to the use with it of a recording apparatus whereby a graphical record of its operations may be obtained on a strip or tape of paper driven by a clockwork mechanism, this and the marking mechanism being under the control of the signal apparatus.

It is not the intention in this report to go into a detailed description of the apparatus or circuits employed, such information being readily obtained by reference to the articles above quoted.

The electric circuits used in this system are complicated, as are the controlling and indicating devices. The arrangement of the wiring is primarily on the open-circuit principle, protection against the undesirable features of such an arrangement being provided by a separate system of circuits and an indicating device known as a "failure detector," this portion of the system working on the closed-circuit principle. While it may be that certain forms of electric contact devices will in time be developed which may be suitable for use in signaling or train-control systems, under the climatic conditions obtaining on most American railroads it is very doubtful if devices of the type used in this system, particularly the auxiliary spring contacts, could be maintained in satisfactory operating condition during a considerable portion of the year in the colder regions of this country.

3. BOUNEVIALLE AND SMITH CAB SIGNAL

The committee had no knowledge before arriving in England of the experiments being made on the Norwood Loop line of the South Eastern and Chatham Railway with the Bounevialle and Smith cab signal, but an opportunity was afforded by the proprietors of the device and the railroad company for an examination.

It is a cab-signal system designed primarily for fog-signaling work and intended to be used as an adjunct to the ordinary fixed, visual home and distant signals of a manual block system or an interlocking plant. This installation was fully described in The Electrician, London, December 20, 1907, but, so far as known to the committee, has not been described in the American technical press.

In each block or interlocking station where this system is used a battery is provided, one side of which is grounded and from the other side of which wires lead through circuit controllers operated by the home signal and distant signal levers for each track out of the cabin and along the roadway to contact rails or ramps about 50 yards long, mounted in pairs and placed between the running rails slightly in the rear of the signals, the visual indication of which is intended to be repeated in the engine cab. The cab signal comprises miniature semaphores operated by magnets, together with electric lights, these being connected by a proper wiring to contactors somewhat in the form of pendulums suspended beneath the engine in such position as to engage the contact rails or ramps. Two of these are provided on each engine in such position as to engage the two rails of the distant ramp, placed slightly to one side of the center of the track, and two others to engage the two rails of the home ramp, which rails are placed slightly to the other side of the center of the track. The four pendulum contacts are intended by contact with the ramp rails to pick up the four following indications: Distant signal on, "caution"; distant signal off, "proceed"; home signal on, "stop"; home signal off, "proceed," the current from the battery in the signal cabin being switched to either the on or the off rail of a ramp by the movement of the signal lever. Normally the pendulums hang nearly vertical, and the engine apparatus is de-energized.

Upon the engagement of the pendulums with the inclined end of a ramp, the pendulums are thrown upward and backward, and by this motion operate a mechanical bell to call the engineman's attention to the fact that his engine is about to pass over a ramp. The pendulums from their own weight and assisted by springs rub upon the contact rails as the train passes over the ramp, it being the intention that one or the other of the pendulums of a pair will pick up current from whichever of the two rails is energized, and thus complete the proper circuit from the ramp through the pendulum (which is insulated from the rest of the engine), through the proper signal magnet in the cab and the proper incandescent lamp, thence through the engine frame and wheels to the rails and the earth, the circuit being completed through the earth back to the negative side of the battery in the cabin. A telephone is provided in the cabin and on the engine cab, so that communication may be had between the signalman and the engine driver whenever the engine is standing over a ramp.

It will be noted that while the engine is running through any block or over a portion of the track not covered by the ramps, the two semaphore cab signals are indicating caution and stop, respectively, and all indicating lamps are out; also, that the presence of current in the circuit is required not only for the proceed indications, but for the caution and stop indications while passing over the ramps. The wiring is thus seen to be on the open-circuit principle, and the only protection against failure to receive a stop or caution indication at a signaling point in case of a failure of battery or the breakage of a wire or a failure of the pendulums to make contact, is through the action of the mechanically operated bell calling the attention of the engineman to the fact that he has reached a ramp.

From the nature of the ramps and engine contacts it is believed that this device would be particularly susceptible to interference from snow and ice, and hence subject to dangerous failures, the only warning of which is the audible one of the mechanical gong.

4. GREAT WESTERN RAILWAY CAB SIGNAL.

This system is installed on 22 miles of the Fairford Branch of the Great Western Railway, which branch is a single track operated under the electric train staff system with fixed home signals, the cab signal being used as a substitute for the distant signals. It represents the attempt of the Great Western to find some reliable method of overcoming the climatic conditions met in its territory, and was designed by Messrs. Jacobs, Insell, Newton, and Bowden, all of the company's staff, and has been developed at Reading under the direction of Mr. A. T. Blackall, the company's signal engineer.

The system provides for a battery in each cabin, one side of which is grounded and from the other side of which a wire leads through a circuit controller which is closed only by the pulling off or clearing of a lever in the cabin corresponding to the distant signal lever. This wire is carried on the pole line along the roadway to a contact rail or ramp placed midway between the running rails at any desired distance from the home signal, being located approximately in the position where a fixed distance signal would be placed if used. The ramp consists of an inverted T section, insulated from supporting chairs by wooden blocks, the inverted T forming a type of construction offering little surface for the accumulation of snow or ice. The engine equipment consists of a battery from which current is normally supplied to a magnet, the circuit including a switch mounted on one end of a contact shoe beneath the engine in such manner that when the engine is not passing over a ramp the contact shoe is normally in position to close this switch, thus keeping the controlling magnet on the engine normally energized on closed circuit. When the contact shoe mounted beneath the engine engages the incline of the ramp or contact rail, the shoe is raised from its normal position, this movement accomplishing two purposes, first, to break the normally closed engine circuit, and, second, by making electrical contact with the ramp to pick up current therefrom to energize another controlling magnet on the engine, should the ramp be energized from the battery in the signal cab by the closing of the contact controlled by the proper lever, this circuit being completed through the grounding of one side of the engine-controlling magnet just mentioned.

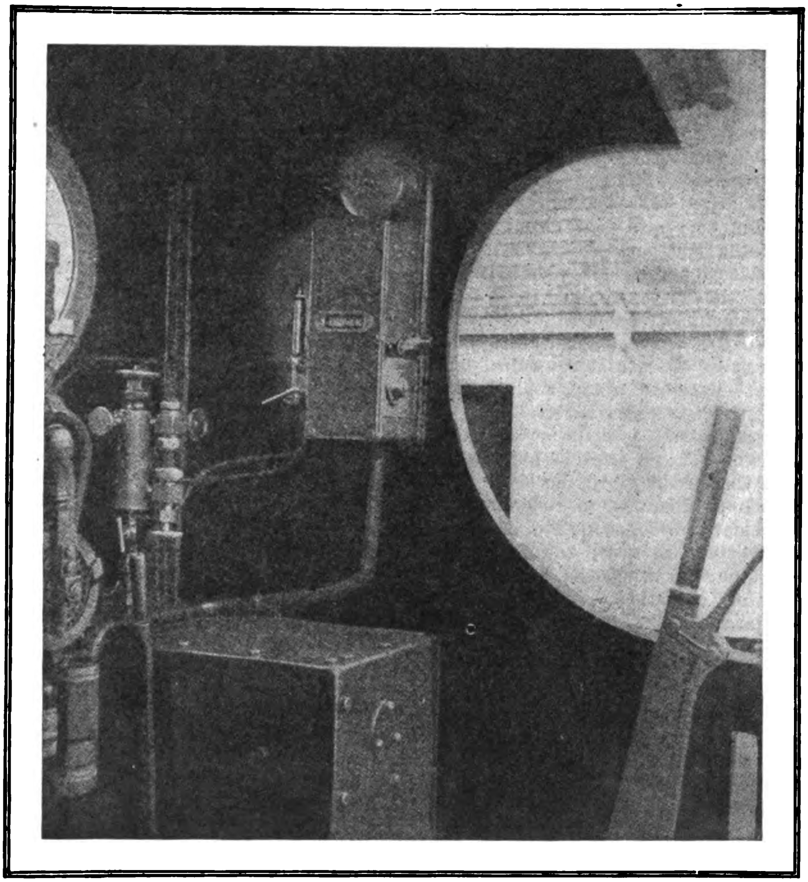

Fig. 1. Great Western Railway Cab Signal

It will be seen from this arrangement of apparatus and circuits that normally the clear signal is maintained upon the engine while running, and that if the conditions are right for the train to proceed the caution indication will be suppressed at the distant signaling point. In order, however, to give a positive proceed signal instead of simply suppressing the caution signal at this point, a polarized relay is provided for the control of the clear indication, which indication consists of the ringing of a bell. In the circuit of the second engine magnet, previously described, is one winding of the polarized relay. When the current is picked up from the ramp, it will, in addition to energizing the engine magnet referred to, also energize the polarized relay, the armature of which will close a local circuit embracing an electric bell and the battery therefor. The second winding of the polarized relay is for the purpose of keeping the local bell circuit closed so that the bell may continue to ring from its local battery after the shoe has passed off the ramp and until the bell circuit is momentarily opened by the engineman operating a break push button. In the circuit of the engine-controlled magnet, first described above, namely, the magnet which is energized from the engine battery itself, is a device controlled by a steam-operated valve so arranged as to open the circuit when the boiler pressure falls to about 20 pounds, insuring the automatic disconnection of the main engine battery in order to prevent the waste of current when the engine is not in running condition. The engine-controlled magnet referred to is used for the control of an air-whistle valve, which sounds the caution indication whenever the engine circuit is broken.

All the apparatus appears to be well designed and the system is exceedingly simple. It is, of course, correctly designed from the electrical standpoint, being not only on the closed-circuit principle, but having the source of energy of the external circuit located in the cabin instead of on the engine, which provides protection against crosses and grounds. For the climatic conditions under which it has to operate, and for the purpose intended, namely, to take the place of a fixed distant signal, it has served its purpose so well in an experimental installation that the railway department of the Board of Trade has given the Great Western Railway permission to take out of service entirely the fixed distant signals on the Fairford Branch where this cab signal is used. It is proposed to make an installation on the main line near Reading, using the cab-signal system in addition to the fixed distant signals, in order to further develop the details of the device under high-speed conditions, the intention being to continue the use of fixed distant signals, irrespective of how satisfactorily the cab-signal device is found to be, so long as any engines unequipped with the device are run over the road.

The principles embodied in the design of this system and a number of its details are believed to be of such merit that the board is arranging a test of an American system designed on practically the same lines.

5. "CROCODILE" CAB-SIGNAL SYSTEM IN FRANCE.

The Northern Railway of France (Chemin de Fer du Nord) is block-signaled throughout and all switches in its main tracks are interlocked with fixed signals. At block stations home and distant signals are used, and in connection with practically every distant signal on the road a form of electric contact rail cab signal is applied. These installations, from the shape of the ramp and its incline, are known as "crocodiles."

In each engine cab there is an air whistle controlled by an electro-pneumatic valve, one terminal of which is connected to ground through the engine frame, the other terminal being connected to a contact brush suspended beneath the engine and insulated therefrom. At each distant signal is located a battery, generally installed in a concrete battery shelter erected above ground, and one terminal of the battery is connected to ground. From the other terminal of the battery a wire is carried through a circuit controller which is closed when the distant signal is in the caution position, thence by the pole line to a point about 50 meters in rear of the distant signal, where it is connected to the crocodile or contact rail.

From this it is readily seen that when the distant signal assumes the caution position, current from the battery is switched on to the line and thence to the crocodile or contact rail and thence picked up by the locomotive shoe and carried to the electro-pneumatic whistle valve, from which point the circuit is completed through ground back to the battery. The remarkable feature of this device is that while this signal provides no proceed indication, and is obviously constructed on the open-circuit principle, and being so arranged that failure to make contact, failure of the battery, or the breakage of a wire would prevent the display of a caution signal on the cab, 2,000 or more of these installations are in use on this railroad and many of them have been in service fully fifteen years.

6. MANUAL BLOCK-SIGNALING SYSTEM.

Signal Apparatus.—There are few automatic block signals in Europe. While there are small installations on double or four track lines in Great Britain and on the Continent, and while some form of the controlled manual block system, notably the Sykes, is used to some extent in England, and the Siemens & Halske system on the Continent, practically all of the English roads use the manual block system.

This simple system of block signaling has been developed to the highest extent in England, and it will be proper to say a word concerning it.

It must be borne in mind that on a considerable proportion of British railways trains are both fast and frequent, yet a comparison of the train accidents occurring under the manual block system in England and in the United States can not but compel the belief that the system has reached a higher degree of perfection in England than in this country.

All of the principal English lines are double track, and on those which carry heavy traffic the blocks are so short that in a good share of the territory the distant signal for one cabin is mounted on the same post as the home signal of the cabin in the rear. The distant signals are practically all mechanically operated semaphores connected to the lever by a single connection, the wire usually consisting of a light galvanized stranded cable. For the home signals both pipe and wire connections are used.

The cabins as a rule are of brick, solidly constructed, and maintained with scrupulous neatness. A square-ended semaphore blade is used for home signals and a fishtail blade, painted red like the home blade, is used for the distant signal. A feature of the indications of these signals peculiar to British lines is that the night indications of both home and distant signals are alike—that is, the proceed indication is a green light and the night caution indication of the distant and the night stop indication of the home consist of each of a single red light. On some four-track lines a ring or other distinguishing mark is added to the blades of signals on the outer tracks to distinguish them from the signals which apply to the inner tracks. The ordinary mechanical locking frames, the signals, and their connections constitute about all the apparatus that is used.

Communication Apparatus.—Communication from cabin to cabin is had by means of an electric-bell system used in connection with the needle telegraph and to some extent with telephones. The use of the needle telegraph, or its equivalent in the shape of a visual indicator operated in connection with the bell circuits, undoubtedly contributes greatly to the successful operation of the system as compared with a system operated entirely by the Morse telegraph, the reason being that with a visible indication, such as that given by the indicator or the needle telegraph, a record is constantly before the eye of the signalman showing the last operation of the communication system. With the use of the Morse telegraph the audible signal of the sounder must, of course, be written down by the signalman on his train sheet or block report to obtain a record of the operation of any portion of the system. Substantially the same forms of block records are kept on the English railroads as in this country.

While bell codes are used in America to a greater or less extent, particularly in connection with controlled manual block-signaling systems, they are not, as a rule, used for conveying such a large amount of information as is transmitted by the English block-signal bell codes. These are very complete in their signals for classifying the kind of train to be moved and the nature of the movement to be made.

Rules.—The rules governing the manual block working are, in general, much like those of American railroads, perhaps the most notable exception in detail working being the blocking back at stations or junctions. The rules for these movements prescribe that at a junction no train on one line is permitted to pass the block station in the rear of the one located at the junction while a conflicting movement is being made on the other line. In the same manner at certain stations one unoccupied block must intervene between the station block and any approaching train whenever a train is standing in the station. These are often suspended, however.

Signalmen.—As a rule, the English block signalman is probably no more intelligent than the American block signalman, but he is probably much better trained and under a stricter personal supervision. Passenger stations are so frequent on English roads that most block stations are under the jurisdiction of some stationmaster, and by far the greater percentage of signalmen are recruited from the ranks of the station porters. A smaller number are promoted from the track forces which furnish most of the fog signalmen, these men forming an important part of the personnel in English railroad operation during the winter months. (A more detailed description of the fog-signaling methods is given in Part III, section F.) Suffice it to say here that the more intelligent trackmen (or plate layers, as they are called) are employed in times of fog and snow at the block stations, and thus have an opportunity to acquire a knowledge of the block system. When a man has served as a plate layer or station porter for a sufficient length of time to become familiar with the general working of the road in his vicinity, and a vacancy occurs in the grade of signalman, he may be selected as a candidate for the post. If so, he is trained under a signalman at the designated cabin for a month, and at the end of that period is orally examined on his knowledge of the rules by the inspector, who, if the examination is satisfactory, fills out a competency certificate. The applicant is generally examined further by the assistant district superintendent who, if the examination is satisfactory, approves the certificate, and the man then appears before the district superintendent, who looks him over and may question him further, and if he is satisfied he signs the applicant's certificate. Should the applicant fail to pass the examination at the appointed time, he may be given another chance or be sent back to his former position at the discretion of the district superintendent. The method of selection and examination here described is that in use on the London and North Western. It is in substance the same on other lines.

If a man is transferred from one cabin to another, his period of training varies from about a week at the new cabin, if it is of practically the same class as his former post, to a fortnight if the new cabin is a more complicated one. Each man is examined not only as to his knowledge of his apparatus and the block-signal rules but in the local working conditions, and it should be noted that the British signalman not only has to perform the functions of signalman, but in addition practically acts as train dispatcher for the blocks controlled from his cabin, for the very good reason that there is no such official as the train dispatcher nor anyone corresponding to him on British railroads.

The traffic conditions on most roads in England vary very little from year to year, as compared with conditions on American roads where new industries are constantly springing up and new lines of traffic of varying volume are being constantly developed. Most of the English lines run through territory already developed and the traffic demands of which are so well known that it is relatively easy to predict within reasonably close limits, from past experience, the nature and volume of the traffic on any division at any given time. On this account a much greater proportion of British freight trains, and in fact all trains can be, or at least are, run on schedule than is the case in this country. In fact, very few trains except work trains are run without a schedule, the extra or special train movements for any month, or even for a single week, being scheduled in monthly or weekly supplements to the working time-tables.

The block signalman is required to be familiar with all these special train movements, and as all schedules are, especially in bad weather, subject to derangement, he must be familiar with a very large number of special rules governing the precedence of delayed trains, there being no dispatcher to give him orders on such matters. In fact, on some roads there is provided a book of "train margins," in which is set forth in detail the precedence of the various trains when they or other trains are late at junctions or other important points. As an example of this method of handling train movement under the block-signal rules, it may be noted that the special trains carrying passengers from the ports of arrival of American steamers to London are scheduled to use a given time between given points. The leaving time of such special trains from the steamship docks, is, of course, variable and the actual leaving time is telegraphed to the principal stations on the line when the train leaves the port. On the basis of this actual leaving time and the published speed schedule the signalmen at junction points throughout the line must make their own arrangements for handling the branch and main line trains with as little delay as possible to either.

Probably the training in the conduct of such movements as those described above assists very materially in connection with the careful and voluminous instructions given to these men and the constant personal supervision to which they are subjected in making them the thoroughly competent and reliable signalmen that they are.

The system of inspection to which they are subject begins with that of the station master, who on some roads is required to make a daily inspection of the cabins under his jurisdiction and certify thereto upon the block report. District inspectors are also employed, who are supposed to visit each cabin about once a week, inspect the records and the work of the men, noting their visit on the block reports. Assistant district superintendents make frequent inspection, and on one road at least, an inspector from headquarters visits each cabin once a year, and in addition to conducting an inspection examines the signalmen orally on the rules and special instructions. On most roads a premium or bonus is paid to signalmen for correct working of the block system, amounting to from £2 to £6 per year. Practically all roads have pension systems for their employes, largely supported, however, by the employes themselves.

As an example of the number of men engaged in signal operation, it may be noted that the Great Western employs 3,200 signalmen on 2,600 miles of territory.

The closing of a block station for a part of the day or night is common, the wires being switched through. In closing a block station the signals are cleared and usually the lights are extinguished, though if the office is to be again opened before daylight they are left burning. An office, say, Station B, may be cut out, the wires being connected through from A to C, if in time of sudden fog B has difficulty in securing fogmen for his signals.

The general impression obtained from an observation of the working of the English manual block system is one of admiration for the men, methods, system of training, and conditions that make possible the high degree of safety and celerity with which a great volume of fast and dense traffic is handled by its use.

(To be continued.)

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The Keihan Electric Railway, Japan.

This railway, which will be the third and longest electric railway in Japan, is now under construction. It will connect Kyoto, a large town with a population of nearly half a million, with Osaka, an industrial center with a population of nearly one million. The total length of the line, which will have a double track throughout its length, is approximately 30 miles. Power for the line will be generated three-phase in a station containing three 850-kw. steam turbo-generator units, and will be transmitted to substations along the line at a pressure of 2,500 volts. In these sub-stations converting plants will transform the power into direct current at a pressure of 550 volts for the overhead trolley-wire. The electrical equipment is being supplied by Messrs. Dick, Kerr and Co., the turbines by Messrs. Willans and Robinson, and the boilers by Messrs. Babcock and Wilcox. The European consultant and inspecting engineer to the company carrying out the work is Mr. H. S. Bickerton Brindley. There is already an ordinary railway between the two centers, and this is now insufficient to deal with the traffic. Although the standard gauge of the steam railways of Japan is 3 feet 6 inches, the new line is being constructed with a 4 foot 8½-inch gauge.—The Railway News, London, England.

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Pennsylvania Steel Passenger Coach.

Much has been said and written during recent years about the increasing number of railroad accidents—their cause and what action should be taken by the government, the railroads and the employes to reduce them and the consequent loss of life and limb resulting therefrom. The first and highest duty of a railroad is to provide the best possible equipment to carry its passengers to their destination with all possible comfort and safety.

With the idea of safeguarding the passenger against fire and accidental injury from telescoping and other causes a number of railroads have introduced the steel passenger coach. The Pennsylvania Railroad now has in operation on its lines east of Pittsburg over two hundred passenger coaches, dining cars, baggage cars and mail cars of the new all-steel type. The frame work of these cars is solid steel and is designed to resist shock and minimize the dangers of collisions. The sheathing which encloses the body of the car is also made of steel. The only woodwork which enters into the makeup of the coach is the window frames. The plush with which the car seats are covered and the hair with which they are stuffed are treated to a fire-proofing process. The floors are made of cement, thus rendering the coach almost indestructible and thoroughly fireproof.

In the transition period from wooden to steel cars it has been noticed that the presence of one or more steel cars in a train of wooden cars, when the former is distinguished by the passengers, causes a general rush to the steel cars.

The new coach is longer than the standard car generally in use on the railroads of this country and has a comfortable seating capacity of sixty to ninety people according to the style of the coach. The seats are adjusted to a more convenient space, and the coaches are all lighted by electricity and ventilated by the most modern and scientific methods.

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*Western Railroad Activities.**

Building More Track.—The Utah Construction Company has been engaged in building 36 miles of track betwen Roseville and Colfax for the Southern Pacific at a cost of approximately $2,000,000. The new line will not parallel the old, but the two will run close together a part of the way, and be separated by several miles at other points. Both lines are to be used—the old one for the west-bound trains on the down grade and the new one for east-bound trains on the up grade.

Have Three Grades.—The Southern Pacific has three surveys for a line from a point east of Colfax to a point near Truckee, and the work will cost from $10,000,000 to $15,000,000 depending upon the survey determined upon and the gradient followed. This work has never yet been started, but it has been seriously contemplated and the scheme awaits only a financial state to be carried into effect. No doubt both lines would be used—adding another 40 miles or more to the long stretch of double track.

To Lay Two-Track System.—In a number of orders recently issued to roadmasters to begin work on a second track as soon as the weather will permit, the Southern Pacific has disclosed a general policy of double-tracking the main line from Oakland, Cal., to Sparks, Nev., a total distance of 245 miles.

This work has been proceeding slowly and without ostentation for some time. Many long stretches are already completed, and other short stretches are being coupled up. Many of the new bridge abutments are wide enough to permit of carrying a double-track bridge, and it is said that when the new bridge to be rebuilt across the American River (the recent structure was swept away by the floods) is constructed it will provide for two tracks.

Will Build to Douglas.—J. C. McClure, chief engineer for the so-called Randolph lines, has announced that the Southern Pacific will build to Douglas, Arizona, and that men and material are being rushed there. The line will follow the survey that was made some five years ago between Pearce and Douglas, and there will be branches to Gleason, Bisbee and Naco.

Have Decided to Build.—The report comes from Guadalajara that the Southern Pacific has decided to construct a one per cent. line through the barrancas of the Sierra Madre near the Jalisco-Tepic boundary. The line will be a little over 20 miles in length, and the total cost will range from $3,000,000 to $4,000,000.

The plans call for 24 bridges and 27 tunnels. It is estimated that at least two years will be required to complete this short branch, which will be one of the scenic routes of Old Mexico.

The Grading Completed.—The grading of the Tuxpan-Furbero road has now been completed, and the entire outfit is at present engaged in freighting machinery, pipe and other supplies to the new oil fields of the Harriman interests. It is thought that through these oil fields Mr. Harriman expects to control the oil situation in Mexico, and is preparing to arrest the supremacy of the English company.

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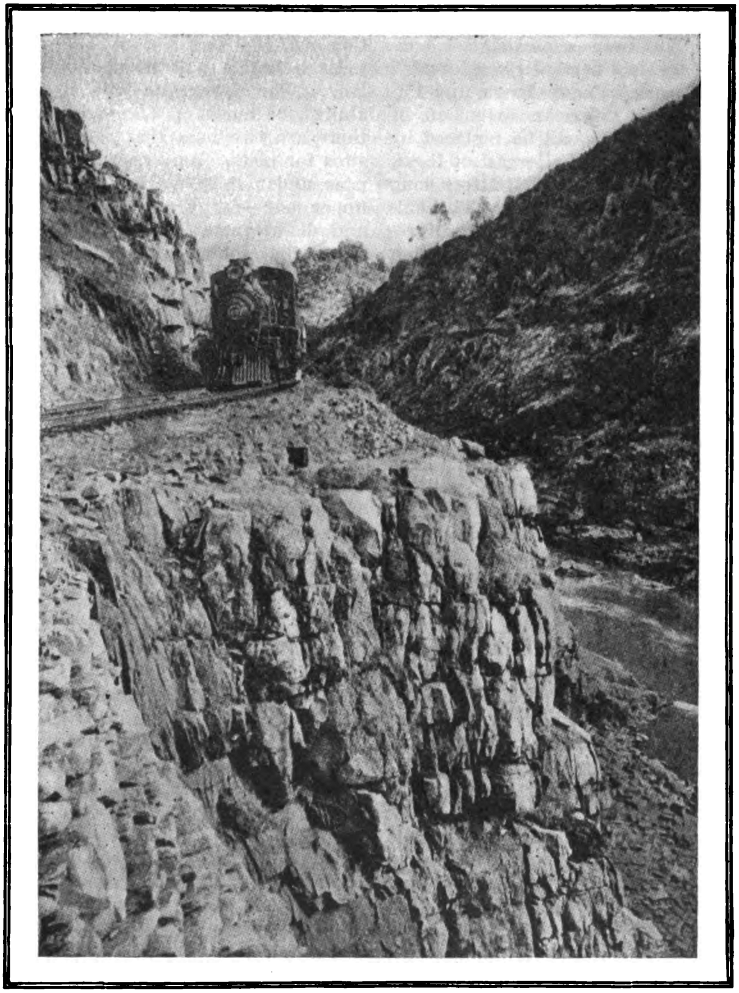
*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

Work on Connecting Link.—The Southern Pacific and Santa Fe railroads, which jointly own the Northwestern Pacific and North Shore lines, have commenced the construction of a bridge crossing the Russian River to connect these roads. The commencement at this time insures its completion before the heavy travel to the summer resorts begins. This bridge is being built at a point midway between Russian River Landing, the present terminus of the road, and Camp Vacation.

Arrangements for Through Traffic.—Arrangements are now being made by the passenger departments of the Gould lines for through trans-continental train service as soon as the Western Pacific line is completed between Salt Lake and San Francisco. This work will surely be completed by the middle of 1909.



VIEW IN "BOX CANYON" ON LINE OF MODESTO AND YOSEMITE VALLEY RAILROAD. ROAD RECENTLY COMPLETED

It will be possible for the system to run through trains all the way from

Pittsburg and Buffalo to San Francisco over its own lines; but it may be for the present, at least, that the officials will content themselves with having such service from St. Louis, running trains over the Missouri Pacific, Denver & Rio Grande and Western Pacific into San Francisco.

Railroad Concrete Bridges.—The announcement has been made that the temporary bridges over several rivers crossed by the Cananea, Yaqui River and Pacific, which is a Mexican extension of the Southern Pacific, will be replaced by concrete structures. The largest of these, over the Yaqui, will be 1,216 feet long and will consist of 16 spans. The culverts on the new line will also be of reinforced concrete. The mountain division between Tepic and Orendain will necessitate a large amount of construction.

A New Line Purchased.—The Willamette Valley Oil Company has purchased the Nez Perce and Idaho Railway now under construction to connect Nez Perce and Vollmer, Idaho. This is believed to be a Harriman purchase, giving him access to a rich field in north-central Idaho. It is predicted the new line will be extended 12 miles to Forest, Idaho, to connect with the Lewiston and Southeastern road.

Construction Work Resumed.—The Southern Pacific has resumed its construction work at Roseville, Cal., and the large force put on will be increased from time to time as more men can be used efficiently. These forces with those employed between Roseville and Colfax will soon number between 5,000 and 6,000 men and hundreds of teams.

A second 30-stall roundhouse is now being completed at Roseville. Other buildings and many acres of yard room are also being completed while the forces in the car shops are being constantly augmented. The present main line between Roseville and Colfax is being practically reconstructed at the same time that the expensive cut-off is being built from Rocklin to Applegate.

Very Difficult Engineering Work.—In the construction of the Copper River Railroad in Alaska, by the Guggenheims, one of the most difficult engineering feats on the American Continent will be involved.

The line strikes across the Copper River flats, as they are called, to the stream itself, and then follows the river to the head of the Copper's enormous head. The river is then crossed to the east side and is followed for several miles; then recrossed again to the west.

These crossings are made necessary by the Childs and Miles glaciers, which come to the river and discharge enormous quantities of ice during the summer. The only route up the Copper is by crossing between the glaciers and starting from Cordova.

Each bridge will be about 1,800 feet long. The upper one will, in all probability, be made up of several spans, as there are two bars that can be used for sites for piers. As immense icebergs will pass under these bridges, especially the upper one—for the ice rapidly crushes and disintegrates after leaving the glaciers—the problem of construction is very much out of the ordinary. Railroad engineers consider this work will be among the most difficult railway construction ever undertaken in the United States, as well as the most expensive.

New Lines to Cut Sierras.—A party of 30 or more surveyors, believed to be in the employ of the Southern Pacific, have been for some time past engaged in running grades through Washoe County, Nevada, and Nevada, Lossen and Plumas counties, in California, and over nearly the same route that was first surveyed for the Western Pacific.

The route contemplates the use of Fredonyer Pass, and if a right of way through it is obtained Mr. Harriman will have gained control of the last practical route through the Sierras, and the route that was nearly determined upon by the Western Pacific.

At least one of the engineers of the Western Pacific expressed himself in favor of Fredonyer Pass over Beckwith Pass. It was through this pass the surveys of Harriman's force of engineers have been made. The lines have been run from a point in Nevada, presumably from the present main line of the Southern Pacific, to Amadee, just across the California-Nevada State line. The route then extends up Honey Lake Valley, passing through Susanville and into Mountain Meadows. The line then runs through the pass into Big Meadows.

Working on Depot, Bridge and Tunnel.—The Western Pacific Railroad has commenced work on the erection of the Niles, Cal., depot. It is to be of the Old Mission style, and promises to be very attractive in appearance. The Niles bridge that was damaged in the recent heavy and protracted storms is being repaired. The second short tunnel in Niles Canyon is being cemented and a portion of the long tunnel is also to be soon cemented. The short tunnel was the scene of a very bad cave-in last January.

Contracts Already Let. — Contracts have been let by the Chicago, Milwaukee & St. Paul for its terminal line at Tacoma, to cost $250,000, and in connection a big car ferry is to be operated. In addition a lumber dock is to be built, which will require 2,000,000 feet of big timber besides 4,000 creosoted piles.

Sufficient Funds Raised.—David H. Moffat has announced that he has raised a sufficient sum in New York to finance the projected Denver, Northwestern & Pacific. Mr. Moffat says he does not intend to extend the road at present, but will let it rest where it is at Steamboat Springs. At some future time construction will be resumed and the road built to Salt Lake City. He positively denies the rumors that the road has been sold to Harriman, Hill, Gould or Clark.

Will Shorten the Line.—The Northern Pacific intends to shorten its line by several miles between Missoula and Spokane, and making the ultimate connection of the company's line from Wallace to the Coeur d'Alene branch at Coeur d'Alene, Idaho.

One of the most troublesome pieces of road the Northern Pacific has had to contend with is the line over the mountains between Wallace and Missoula. Much of the grade is 4 per cent. and the curves are heavy in winding over the mountains. A tunnel through some advantageous portions of the mountains would eliminate a large portion of the heavy grade and shorten the distance 25 miles or more.

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Licensing Locomotive Engineers.

It is rumored about several of the state legislative halls that a movement in the direction of the licensing of locomotive engineers is being drafted. Several of the States have provided in this way for stationary engineers and the United States government looks after the marine engineers. It is safe to say that, had the only owners of steam plants and of steamboats been efficiently organized corporations from the time steam commenced to be used as a motive power, there would have been no necessity for license laws. It is the operator who financially suffers most through the mistakes of ignorant engineers, and knowing this fact the corporation organization does not furnish a berth to the ignorant man, except in positions of no responsibility. A license law could add nothing to the intelligence of railroad enginemen unless it begins where present methods leave off; and it is not often argued that present-day enginemen are insufficiently educated and experienced for their positions. There is no state license law which compels a man to fire a boiler for more than three years before he is allowed to take his examination. It would be strange indeed, therefore, if a locomotive engineman could not pick up the requisite knowledge of the peculiarities of a steam boiler in the five to eight years of firing which he gets. It is safe to say that the railroad enginemen have to pass examinations of far wider scope and application than do any of the engineers in the stationary or marine field and it is difficult indeed to see how any benefit can result from an extension of the license laws to include railroad enginemen. It is needless to say that the benefits would have to be many and immediately certain before the disadvantages of such a handicap were offset.—Railway and Engineering Review.

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Convention of the American Railway Engineering and Maintenance of Way Association.

The American Railway Engineering and Maintenance of Way Association held its tenth annual convention at the Auditorium Hotel, in Chicago, Ill., beginning March 16th last. President William McNab called the opening session to order and in his address to the convention spoke as follows:

Your association has completed a decade of active work, and during that period has made an enviable record, and now occupies a prominent position in the front rank of railway organizations and engineering societies.

The advantage gained by this status turns on the beneficial influence it exerts in connection with the objects of the association—the advancement of knowledge pertaining to the scientific and economical location, construction, operation and maintenance of railways—an influence which has been imparted to the railway world in a degree of usefulness, universal in its scope and almost unparalleled in its import. This feature should be especially gratifying to the members on this particular anniversary. More especially should this appeal to us, as few (if any) kindred bodies have, within the same period or similar length of time, acquired the growth, stability, practical usefulness and, in general, the high standing attained by this association.

In modern days, the science of railway engineering occupies a wide range in the domain of civil engineering in the generic sense. This fact was appreciated even in the early days of railway construction, by the compilers of the lexicons of that period, the term "Civil Engineer" being defined by them as "one who plans railways, harbors, docks," etc.—railways apparently being given first place in importance.

From these early days down to the time when the present classification of expenditure was introduced, each railway was practically a law to itself in regard to physical standards, as well as to clerical and accounting methods considered necessary for its proper care.

In the course of time, however, the field covered by what is comprehended under the term railway engineering became so enlarged and so important, that direct supervision in detail from one source was found inadequate, even though the authority enjoyed the broad title of civil engineer.

During that period there was, in a more or less degree, a lack of proper appreciation of the value of technical education and training as an adjunct to the practical working of the railway, and the results of experiments made from time to time by certain railways individually to establish a justification for proposed changes were, in regard to real value, not altogether satisfactory to the railway world in general. The experience gained from such investigations, desirable or undesirable as the case might be, was often acquired only after the expenditure of large sums of money, direct or indirect, and the ascertained facts were jealously guarded by the interests concerned.

To the railway world, however, the results of such investigations, even if known to be of benefit, did not meet all the requirements essential to a comprehension of what was expedient from an economic standpoint, and the lesson which should have been taught, viz., that as much, if not more, valuable experience is to be acquired through failures rather than from successes, was not properly brought home.

The text-books upon particular subjects connected with railway engineering in use in earlier days, were produced under private or individual auspices. As a general rule they were ably edited, yet the perspective embraced was circumscribed by reason of existing circumstances, and the value of their use was necessarily limited on account of lack of systematic reissue of such volumes with supplements to meet changing conditions. Special articles upon railroad technical matters which appeared from time to time lacked the value of full discussion, and information thus imparted did not meet requirements, therefore, the interest created could only be looked upon as more or less temporary and superficial.

Railway engineering, as a great department of knowledge, eventually came to be so subdivided in order to meet the conditions of the times, that each subdivision practically developed into a distinct science, yet each department retained possession of all the elements tending to form a harmonious whole. Evolution in this respect, however, progressed slowly, and the methods and standards in use were in many instances adhered to too long, partly because their chief recommendation lay in the fact that they were time-honored or that there was a lack of knowledge of better substitutes.

Nowadays, fewer text-books on details of railway construction and maintenance emanate from private sources, for the output of your association, viz., the conclusions and principles of practice emanating from its various committees, which eventually find their way into the Manual of Recommended Practice, have become the source of appeal in their respective spheres. If reference be made to the discussions preceding the adoption of such conclusions and principles of practice to be found in our proceedings, it will be noted that every detail has been thoroughly covered.

The bibliography of the association is, in consequence, liberally made use of to advantage, not only by the members, but by the executive officers of our railways as being practically authoritative on railway technical details. In this general connection, we are amply justified in stating that there need be no hesitancy in accepting as good modern practice, based upon scientific methods, the general principles which are recommended therein. You are all aware that before any of the various recommendations are adopted and disseminated, they have been thoroughly discussed and voted upon in open convention by the most competent and up-to-date body of railway engineers to be found anywhere, and in no other organization is there a greater degree of care exercised to guard against inconsistencies than is exhibited in our own.

But while there is every reason to be proud of our achievements during these past ten years, we should not rest content, but endeavor to keep our work up-to-date by eliminating from our Recommended Practice what in course of time has become obsolete and perfecting that which is considered worthy of retention, in order that our recommendations may be safely relied upon as representing the best practice that can be devised for the time being.

In no quarter of the world do the diversities of nature, both physical and climatic, exist in a greater degree than on the North American Continent, and for this reason the problems confronting railway engineers afford ample opportunity for the exercise of that particular knowledge which your association was formed to advance, namely, that pertaining to the scientific location, construction, operation and maintenance of railways.

Great progress has been made in that respect since the formation of the association ten years ago, as will be noted by reference to the historical sketch prepared by the secretary. It is realized more fully that the railway problems coming under our immediate purview are being brought under the influence of common conditions and tendencies.

We meet the propositions which ever present themselves with the knowledge that conditions today are not to be governed entirely by the experience acquired in earlier days. It is our endeavor also to realize how in carrying out the objects of the association, true economics require proper discernment between what is expedient and what is essential, as well as a clear insight into what will tend to the permanent commercial success of the companies by whom we are respectively employed. We are also striving, and not unsuccessfully, for a better understanding of the relationship of capital invested to maintenance and operating expenses. In this respect it is borne in mind, that as the ratio of progress of all kinds is ever increasing, and that as railways are commercial undertakings, the various factors which produce the greatest permanent profit per cent. of the expenditure as well as those which have an adverse effect must be carefully studied. We realize more and more the value of a free exchange of experiences and the practical uses that such exchange can be put to as well as the results brought about by scientific analysis of theories that have not yet been put to experimental tests.

Since your last convention, the board of directors, as well as the association as a whole, has been called upon to sustain a heavy loss in the removal by death of two of its most valued members, namely, your late president, Walter G. Berg, and D. D. Carothers, member of the board of direction. In every department of the association's interests with which they were respectively connected, their work was accomplished with a thoroughness that left a deep and lasting impress upon the minds of their colleagues and fellow-members, while the genial personality of each endeared them socially to the membership generally. Opportunity will be afforded during this convention for remarks from members eulogistic of the life and character of both the deceased officers.

Your president having been actively connected with the association since its inception, desires now to bear testimony to the zeal shown by the officers and directors in shaping the destiny of the association, and guarding its best interests. Acknowledgment is also made of the earnest devotion of the chairmen, vice-chairmen and members of the committees, and of the members of the association individually in the work, and it may be accepted as entirely within the limits of modesty if it be said that by reason of the elements just mentioned, the work has been carried on with a degree of perfection that otherwise would have been impossible.

It may also be said that during the past decade railway construction could not have progressed to the extent and in the manner it has, nor the railways themselves been as efficiently maintained as they have been and are being maintained, if it had not been for the organization and co-operation, shoulder to shoulder, individually and collectively, of the members of the American Railway Engineering and Maintenance of Way Association.

The report of the secretary and treasurer showed a cash balance on hand of $16,147, and an increase in membership during the year from 680 to 784. Reports presented for consideration of the convention were as follows: Uniform Rules; Signaling and Interlocking; Brine Drippings from Refrigerator Cars; Yards and Terminals and Rail; Track; Ties; Bridges and Trestles; Wood Preservation; Ballasting; Records, Reports and Accounts; Signs, Fences, Crossings and Cattle Guards; Roadway; Buildings; Iron and Steel Structures, included with which was a report of the sub-committee on Length of Flat Spots on Car Wheels; Uniform General Contract Forms; Masonry. Progress reports from committees were also submitted as follows: Economics of Railway Location and Electricity; Conservation of Natural Resources; Standard Specifications for Cement; and to cooperate with the National Advisory Board on Fuels and Structural Materials.

Committees for the ensuing year will deal with subjects as follows: Roadway; Ballasting; Ties; Rail; Track; Buildings; Wooden Bridges and Trestles; Masonry; Signs, Fences, Crossings and Cattle Guards; Signaling and Interlocking; Records, Reports and Accounts; Uniform Rules; Water Service; Yards and Terminals; Wood Preservation; Iron and Steel Structures; Economics of

Railway Location; Uniform General Contract Forms; Electricity.

The election of officers for the ensuing year resulted as follows:

President, William McNab, principal assistant engineer, Grand Trunk; First Vice-President, L. C. Fritch, consulting engineer, Illinois Central; Second Vice-President, W. C. Cushing, chief engineer maintenance of way, Pennsylvania Lines, Southwest System; Secretary, E. H. Fritch; Treasurer, W. S. Dawley, chief engineer, Missouri & North Arkansas.

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Interstate Commerce Commission.

Standards for the Protection of Trainmen on Freight Train Cars and Locomotives.

Cars of construction not covered specifically in the following sections, relative to handholds, sill steps and ladders, shall be considered as of special construction but shall have the same complement of handholds, sill steps and ladders as are required for cars of the nearest approximate type.

BRAKE SHAFTS.

(1) The brake shaft to be located on the end of car, preferably to the left of the center thereof, when facing the end of car.

(2) On cars without fixed ends the location of brake shafts to be suitable to the car construction and operation.

(3) The ratchet wheel to be secured from turning on the brake shaft.

(4) The brake pawl to be fastened to a suitable casting or plate attached to the car body or brake step.

RUNNING BOARDS.

(1) Box and other house cars to be provided with running boards on roof, not less than 18 inches wide.

(2) Longitudinal running boards on tank cars used in connection with safety railings to be not less than 10 inches wide. Running boards will not be required on tank cars having floors.

(3) The ends of all running boards to project over the ends of cars not less than six inches and to be properly supported.

SILL STEPS.

(1) One substantial sill step to be secured to each side of each end of car, as near to the end as practicable.

(2) Sill steps to be made of wrought iron or steel about ½ by 1½ inches cross sectional area or equivalent.

(3) Sill steps to be about 12 inches long between the sides, measured horizontally at the tread.

(4) The lower treads of sill steps to be about 24 inches and not more than 32 inches above the rail, the clear depth of sill steps to be not less than 6 inches.

(5) Sill steps exceeding 18 inches in depth to have an additional tread above the lower tread, and such sill steps to be laterally braced.

(6) Each side of sill steps on cars to be securely fastened by means of lag screws, bolts or rivets.

LADDERS.

(1) Box and other house cars and all cars, the top of which cannot be reached from sill steps or platform end sills, shall have two wrought iron or wooden ladders.

(2) Ladders to be located at diagonal corners, on right-hand end of sides of cars or left-hand side of ends of cars. When cars have projecting end sills, ladders may be located near centers of ends of cars.

(3) Ladder treads of wrought iron or steel to be of ⅝-inch nominal diameter; or of hardwood, to be nominally 1½ by 2 inches, about 16 inches clear length.

(4) The spacing of treads of ladders to be about 18 inches.

(5) All ladder treads shall have a minimum clearance around them of 2 inches, nominal clearance 2½ inches.

(6) When wrought iron or steel ladders without sides are placed on ends of cars with nonprojecting end sills, the bottom treads to have a guard or upward projection at inside ends.

(7) Tank cars having running boards to be provided with suitable ladders to give access to the running boards; the ladders to be located on right-hand end of sides of cars or left-hand side of ends of cars when running boards are continuous around the car. If running boards are not continuous, ladders to be so located as to give access to each end of each running board. Treads of ladders to be spaced about 18 inches apart.

HANDHOLDS.

(1) Box and other house cars shall have handholds on roofs, in line with each ladder, running parallel with the ladder treads.

(2) Roof handholds to be placed not less than 2 inches nor more than 18 inches from the edge of the roof and the length to be not less than 10 inches in the clear, unless the construction of the car will not permit.

(3) Box and other house cars with end ladders to be provided with a horizontal handhold, 16 inches in the clear or longer, on each side of each car over sill step; located not less than 18 inches nor over 24 inches above center line of coupler; and

(4) Each end of car to be provided with two horizontal handholds, not less than 16 inches in the clear, located not less than 18 inches nor more than 24 inches above the center line of coupler, outside end of handhold to be about four inches from outside of car. A ladder tread when properly located and having proper clearance around it is a suitable end handhold. A coupler unlocking rod is not a suitable end handhold.

(5) Box and other house cars having side ladders located over sill steps, a tread of such ladder not over 24 inches above center line of coupler is an effective handhold. Ladder treads to be about 16 inches clear length.

(6) Each end of car to be provided with two horizontal handholds, not less than 16 inches in the clear, located not less than 18 inches nor more than 24 inches above the center line of coupler; outside end of handhold to be about 4 inches from side of car. Coupler unlocking rod is not a suitable end handhold.

(7) Gondola cars with drop ends to be provided with a horizontal handhold on each side of each car over sill steps, with as much clear length as the car construction will permit, provided same need not exceed 16 inches. Handholds to be located not less than 18 inches nor more than 24 inches above the center line of coupler.

(8) Gondola cars with drop ends to be provided with two end handholds not less than 16 inches in the clear, at each end of car, placed on the face of the end sill; or

(9) If preferred, the end handhold may be placed on the face of the end sill, projecting downward so as to give at least three inches clearance below the bottom of the sill. The coupler unlocking rod is not a suitable end handhold.

(10) Gondola cars with fixed ends to be provided with a horizontal handhold on each side of car over sill steps, with as much clear length as car construction will permit, provided handholds need not exceed a length of 16 inches in the clear. Handholds to be located not less than 18 inches nor more than 24 inches above center line of coupler.

(11) Gondola cars without projecting end sills, having ladders located on sides, to have one vertical or horizontal handhold at upper corner of left-hand side of brake end of car.

(12) Vertical handhold to extend downward from about 4 inches from top of car; horizontal handhold located about 6 inches from top of car.

(13) Each end of each car to be provided with two horizontal handholds, not less than 16 inches in the clear, located not less than 18 inches nor more than 24 inches above center line of coupler; outside end of handhold to be about 4 inches from outside of car. The coupler unlocking rod is not a suitable end handhold. The brake step bracket is not a suitable end handhold.

(14) When the side of a gondola car is too high for a man standing on the step to reach the top, there should be one additional vertical handhold placed on left side of end of car, extending within about 4 inches of the top, to be about 18 inches long.

(15) All tank cars to have a safety railing for each running board, not less than 30 inches and not more than 5 feet above platform or above running board. Hand railing may be on the outside of running board, secured to side frame, or may be on the inside of running board, secured to tank or tank bands; or, in case of there being one overhead running board, the hand railing may be secured to top of tank, or tank bands.

(16) Tank cars with end platform and without hand railings extending around the ends of the tank to have a horizontal handhold of as much length in the clear as the diameter of the tank will permit, secured to each head and located not less than 30 inches and not more than 5 feet above platforms.

(17) Tank cars to be provided with a horizontal or vertical handhold, 16 inches in the clear or longer, on each side of each car over sill steps. Tank cars having safety railings secured to the tank to be provided with an additional vertical handhold attached to the tank.

(18) Tank cars provided with side

safety railings, supported by posts which are not more than 2 inches on each side or 2 inches in diameter; the posts are suitable side handholds if located over sill steps.

(19) Tank cars to be provided with two horizontal end handholds, at least 16 inches in the clear, placed on the face of the end sill projecting outward, as provided for flat cars; or

(20) If preferred, the end handholds may be placed on the face of the end sill, projecting downward such a distance as will give at least three inches clearance below the bottom of the sill. The coupler unlocking rod is not a suitable end handhold.

(21) Tank cars with side platform and hand railings secured to side frame to have handholds.

(22) Tank cars without end sills, the end handholds may be secured to tank heads, or to end running boards on cars so equipped.

(23) Tank cars without through side sills but having running boards and safety railings secured to tank or tank bands to have handholds.

(24) Flat cars to be provided with a horizontal handhold on each side of each car over sill steps, with as much clear length as the car construction will permit, provided same need not exceed a length of 16 inches in the clear.

(25) Flat cars to be provided with two end handholds at least 16 inches in the clear, at each end of car, placed on the face of the end sill projecting outward; or

(26) If preferred, the end handholds may be placed on the face of the sill, projecting downward such a distance as will give at least three inches clearance below the bottom of sill. The coupler unlocking rod is not a suitable end handhold.

(27) Hopper cars to be provided with horizontal handholds on each side of each car over sill steps, with as much clear length as the car construction will permit, provided handholds need not exceed a length of 16 inches in the clear. Handholds should be located not less than 18 inches nor more than 24 inches above center line of coupler.

(28) Hopper cars without platform end sills, having ladders located on sides, to have one vertical or horizontal handhold at upper corner of left-hand side of brake end of car.

(29) Vertical handhold to extend downward from about 4 inches from top of car; horizontal handhold located about 6 inches from top of car.

(30) Each end of hopper cars to be provided with two horizontal handholds, at least 16 inches in the clear, located not less than 18 inches nor more than 24 inches above center line of coupler. A tread of ladder when properly located and having proper clearance around it is a suitable end handhold. The coupler unlocking rod is not a suitable end handhold. The brake step bracket is not a suitable end handhold.

(31) Caboose cars having end platforms should be equipped with handholds on the end sills, the same as provided for flat cars.

(32) Caboose cars not having end platforms to be equipped with side and end handholds, same as described for box and other house cars.

(33) Caboose cars having side doors, to have vertical handholds on each door post and suitable steps below doorway.

(34) Curved hand railings located so as to facilitate catching caboose cars under motion, will be considered as suitable handholds.

Handhold and Ladder Tread Fastenings, Dimensions and Clearances.

(1) All handholds and ladder treads applied on wood to be secured by through bolts or lag screws.

(2) When bolts are used, they should be not less than ½ inch diameter, with nuts on the outside wherever possible, and riveted over.

(3) When lag screws are used, they should be not less than ½ inch diameter, 3 inches long, and screwed full length into the wood.

(4) When rivets are used they should be not less than ½ inch diameter.

(5) All handholds and ladder treads shall have a minimum clearance around them of 2 inches, nominal clearance 2½ inches.

(6) All handholds and ladder treads made of wrought iron or steel to be of ⅝ inch nominal diameter, or larger.

COUPLERS.

(1) The law requires the use of couplers that will couple automatically by impact and that can be both coupled and uncoupled without the necessity of men going between the ends of the cars.

It is considered that any standard make of M. C. B. coupler fulfills the requirements of law when properly applied and maintained in proper working condition.

LOCOMOTIVES.

(1) Locomotives must be equipped with automatic couplers both at the rear of tender and front of engine.

(2) Tenders should have two handholds in the rear ends and two handholds in each side. The rear end handholds may be applied after the manner recommended for either the flat car or the box car equipment. The handholds in the sides near rear end should be applied as per box car recommendations and the handholds in the sides near the front ends should be applied vertically for greater security to men mounting and dismounting the locomotive. Sill steps should be applied under all side handholds.

(3) The clearance between the handhold and the piece to which it is fastened should be not less than 2½ inches.

(4) Handholds on the sides of the locomotive at the front end are not required. A handhold should be placed on the pilot buffer beam on each side of the front end of the locomotive. If the uncoupling rod has a diameter sufficient to give the required stiffness and has proper clearance of not less than 2½ inches, it will answer as a handhold. If the uncoupling rod extends only from one side of the engine to the coupler, a handhold should be placed on the opposite side of the bumper. If the uncoupling rod extends across the front end of the engine, no other handhold is required there. A flag standard is not a satisfactory substitute for a handhold. Pilot coupler braces, if at proper height to be conveniently and securely reached by employes and if they have sufficient clearance, will serve as substitutes for handholds.

(5) There should be a convenient foothold or step on the pilot to be used in connection with the handhold to reduce to a minimum the danger to employes when riding the pilot.

(6) All locomotives should be equipped with power driving wheel brakes and appliances for operating the train brake system.

(7) Locomotives used in switching service should be equipped with foot boards extending the full length of each end, such boards to be 1 foot in width and placed not more than 6 inches from the tops of the rails.

(8) Suitable hand rails extending entirely across both front and rear should be provided for use in connection with these foot boards.

(9) Road engines should not be used in switching service unless the pilots are removed and standard foot boards and proper handholds applied both to the front of engine and rear of tender.

Standards for the Protection of Trainmen on Passenger Train Cars.

(1) Passenger train cars having open end platforms should be equipped with handholds on each side of each end of car, not less than 16 inches in the clear, fastened to the face of the end sill and projecting downward so as to give at least three inches clearance below the bottom of the end sill.

(2) Passenger train cars having wide vestibules, the side door posts to be equipped with vertical handholds of 16 inches clear length or longer.

(3) Passenger train cars having wide vestibules also to be equipped with end handholds, one on each side of each end of car, not less than 16 inches in the clear, attached to the face of the platform end sill, projecting downward to such a distance as will give at least three inches clearance below bottom of sill.

(4) Passenger train cars not equipped with platforms to have a horizontal handhold, not less than 16 inches in the clear, on each side of each end of car, over sill steps.

(5) Passenger train cars not equipped with platforms to have a metal sill step at each side of each end of car, as near the end as practicable, with tread not less than 24 inches nor more than 32 inches from the rail.

(6) Passenger train cars with projecting end sills to have end hand railings extending across the ends of the cars, except within end doorways or vestibules, located a suitable height above top of end sills.

(7) Such cars also to be equipped with end handholds, one on each side of each end of car, not less than 16 inches in the clear, attached to the face of end sills or buffer beams, and projecting downward so as to give at least three inches clearance below bottom of sill.

(8) Metal sill steps on passenger train cars to be not less than ½ by 1½ inches across sectional area or equivalent, and to be securely fastened to the car.

(9) Handholds on passenger train cars to be made of metal of ⅝ inch nominal diameter, and to be securely fastened to the car.

(10) Passenger train cars without end platforms, but with side doors, to have vertical handholds and suitable steps below doorway.

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Telephones for Canadian Pacific Railway Despatching.

Mr. B. S. Jenkins, general superintendent of Canadian Pacific telegraphs, in reply to an inquiry regarding the report that the company intended to build a telephone line from Winnipeg to Brandon for the operating of trains, made the following statement:

"During the last few years great improvements have been made in telephone apparatus, with the result that uses can be made of it which were not possible in earlier years. During the last three years the Canadian Pacific, with other roads, has been making experiments in the use of the telephone for train despatching. Early last season telephone equipment was supplied to the line from Montreal to Farnham, a very busy section, and the success of the test was so marked that the equipment was continued to Newport. Early in the year Mr. Whyte, who keeps in the closest touch with all new developments, requested from me estimates for certain sections of western lines. As a result, appropriations were secured for the immediate installation of telephone equipment on two important sections, namely, from Winnipeg to Brandon, 133 miles, and from Swift Current to Medicine Hat, 150 miles. Heavy copper metallic circuits will be provided, two heavy copper wires being strung on each section. These circuits will be entirely self-contained, the signaling and talking all being done on the same pair of wires. Semi-automatic selectors will be used for signaling, which will enable despatchers to ring at will vibrating bells in one or more offices on the line. This has been found to be a less laborious method of calling an operator than the use of the telegraph and the saving in time has been very great. In each of the local offices a four-inch vibrating bell, large enough to be heard at a considerable distance, is installed, and when this bell is rung without warning, the one thought of the operator is to shut it off and the call is answered immediately. In practice it has been found that, in order to forestall the despatcher in the ringing of the bell, the operator will report the train the instant it has passed.

"In handling train orders by telephone the same method is used as with the telegraph. The use of the telephone is very quick and flexible, and the despatcher is able to get much more detailed information with reference to what each train is doing. He can talk personally to the conductor and the engineer, and is brought much nearer to the train movement.

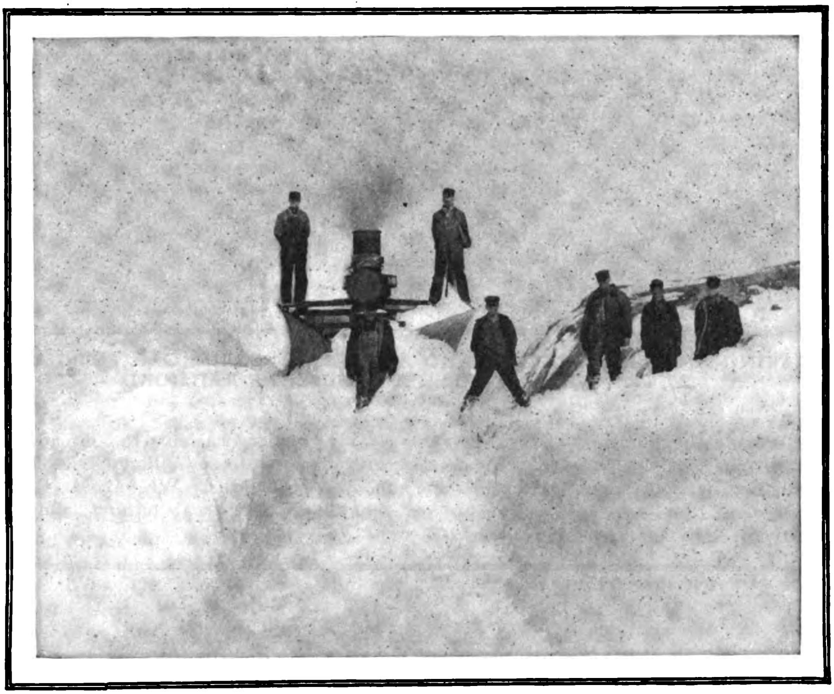
"An obvious advantage of the telephone train operation is found in the fact that any person can use the system, while only the trained telegrapher can use the key. I have no doubt that for train operation the telephone will supersede the telegraph, but for the transmission of commercial or business telegrams where a record is required, the telegraph will continue to hold the field. As an illustration of this fact, the telegraph company is called on daily to transmit telegrams confirming agreements and contracts which have been arranged by telephone."

On being asked why the railway company was installing the telephone wire west of Winnipeg on the single track, rather than east of the city on the double track, Mr. Jenkins made the interesting statement that although, in theory, it had been supposed that a telephone would be of much greater use on a double track than a single track, it had been found by actual experiment that while the telephone was of great value on a double track, it was of still greater value when the traffic was confined to a single track. In addition to the two circuits mentioned by Mr. Jenkins there is another authorized between White River and Fort William, Ont., 251 miles on the north shore of Lake Superior, says Mr. Wm. J. Camp, of Montreal, electrical engineer of the Canadian Pacific system. This, he says, is no doubt the longest telephone despatching circuit yet undertaken.—Telegraph Age.

Echoes from the Firing Line

A Trip to Willow Creek.

February 20th the snow-bucking crew stopped in front of the office at North Kemmerer and received orders to run extra, North Kemmerer to Quealys. The wind was blowing a gale, and it was snowing something fierce, but "we have to have the coal," says the coal company.



CREW AT WINONA CUT IN ABOUT 12 FEET OF A DRIFT, FEBRUARY 19, 1909, WILLOW CREEK AND SUBLETT RAILROAD

With Engineer Shroy at the throttle on the 503 we left at 8:15 a. m., helped with engine 1071, Engineer Hogan, and your uncle, the photographer, riding on the second engine. Everything went fine till the wedge engine 503 struck Willow Creek Gap. Then our grief started. We bucked and rebucked till finally we decided to make a last attempt. Going back about a half mile for a good start we came into the cut head on, and we surely went through this time, the snow being from eight to ten feet deep.

After getting out of Willow Creek Gap we had clear sailing till we struck Winona cut, at bridge 13-B. This is one of the highest bridges on the line, there being 17 bridges in 9.8 miles of track. After making careful examination of the depth of the snow we decided to try her a whirl. Engineer Hogan, with the 1071, (the pride of his life) coupled on, and we were off for no one knew where, only that we had about 10 to 12 feet of snow and about 800 feet long to clear. Getting well into it with some tall bucking we backed out and made another run. This time we went clear off the rail. Engine 1071 pulled us back on the track, and with the aid of shovels manned by all of us we managed to clear the track for some distance. Then we hit it another whirl. This time we went up against it—we were stuck. Then your

MAKING ANOTHER GREAT STAND AT WILLOW CREEK GAP, FEBRUARY 20, 1909, WILLOW CREEK AND SUBLETT RAILROAD

uncle made the pictures, and we got off our surplus clothing and began the work of digging her out, which consumed some time.

This is what we have to contend with every time we go to Willow Creek during the winter months. We have at Quealy one of the best coal mining camps of

SNOW BUCKING CREW OF THE O. S. L. ON THE WILLOW CREEK AND SUBLETT RAILROAD, NEAR MINE No. 5, FEBRUARY 20, 1909, WHERE THEY WERE STUCK FOR EIGHTEEN HOURS

Wyoming, putting out some of the finest coal that one would wish to see. It is situated up the canyon nine miles from Kemmerer, while at Susie is another mine of equal value, and both these mines are working full blast, taking out some twenty-five to thirty-five cars every two days.

Here is where the switchmen get their money's worth, working from 8 to 16 hours, and when they go out on this run they always take a good supply of eatables with them, as they figure on getting back some time.

Cert 5088.

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In the "Good Old Times."

I don't know whether a letter from an old railroader long out of the service will be read with interest or not, but as I was reading the Magazine and noting the troubles the brothers are having in different parts of the country trying to fire with soft coal and not make smoke, some with poor coal, hard steamers, poor business, etc,, my mind went back to the days of a good while ago, when we all had the same old troubles of our own, same as the boys have now.

In the "good old times" we had small engines loaded to the limit, also covered to the limit with brass, which we were always expected to keep polished at each end of the road—and in the middle, too—or we heard from the M. M., as well as the engineer, who also expected us to get around to the house and get the "old girl" out, fix her fire, get her coaled up, the tank filled, draw all supplies, fill all the rod cups, fill and clean the headlight, lubricators, signal and deck lights, and then back around ready to couple on to the train. That's all we had to do, except keep her hot while on the road and watch for crossings and ring the bell. One hundred and thirty was high pressure then, and I can assure you it was as hard work to keep that as it is 200 on the engines of today.

I note in the Magazines of February and March articles on coal briquets. I will say that they were used on the D. & H. R. R. thirty years ago and were not a howling success, as any one who fired them then can testify. Some points are the same now as then, as to the loss by handling, no clinkers but a pan full of hot ashes all the time. As for the smoke, it was simply abominable. They make no more smoke than does soft coal, but it is vile what there is of it. It burned the skin off our hands, face and neck, ruined our eyes, cut the flues, caused leaks and profanity, and was a source of discomfort to every man on the train, and no man who ever fired a leaky engine on a heavy train or a good engine on a fast train with the "brick," as they were known then, ever got mad and quit because he could not have the same job the next day. Unless the science of man has improved the stuff greatly over what it was thirty years ago, it would require two extraordinarily good firemen on our large engines of today and a tender twice the size we have now, as it takes a carload to run a train of the size and speed of today 150 miles. They also require a sharp draft, and that means reducing nozzle tips to get it, and any engineer knows what that does to the speed.

I was quite interested in the B. & O, machine shown on page 337 of the March issue, as I was employed at the works where she was built and had a small hand in her construction.

Member, Lodge 209.

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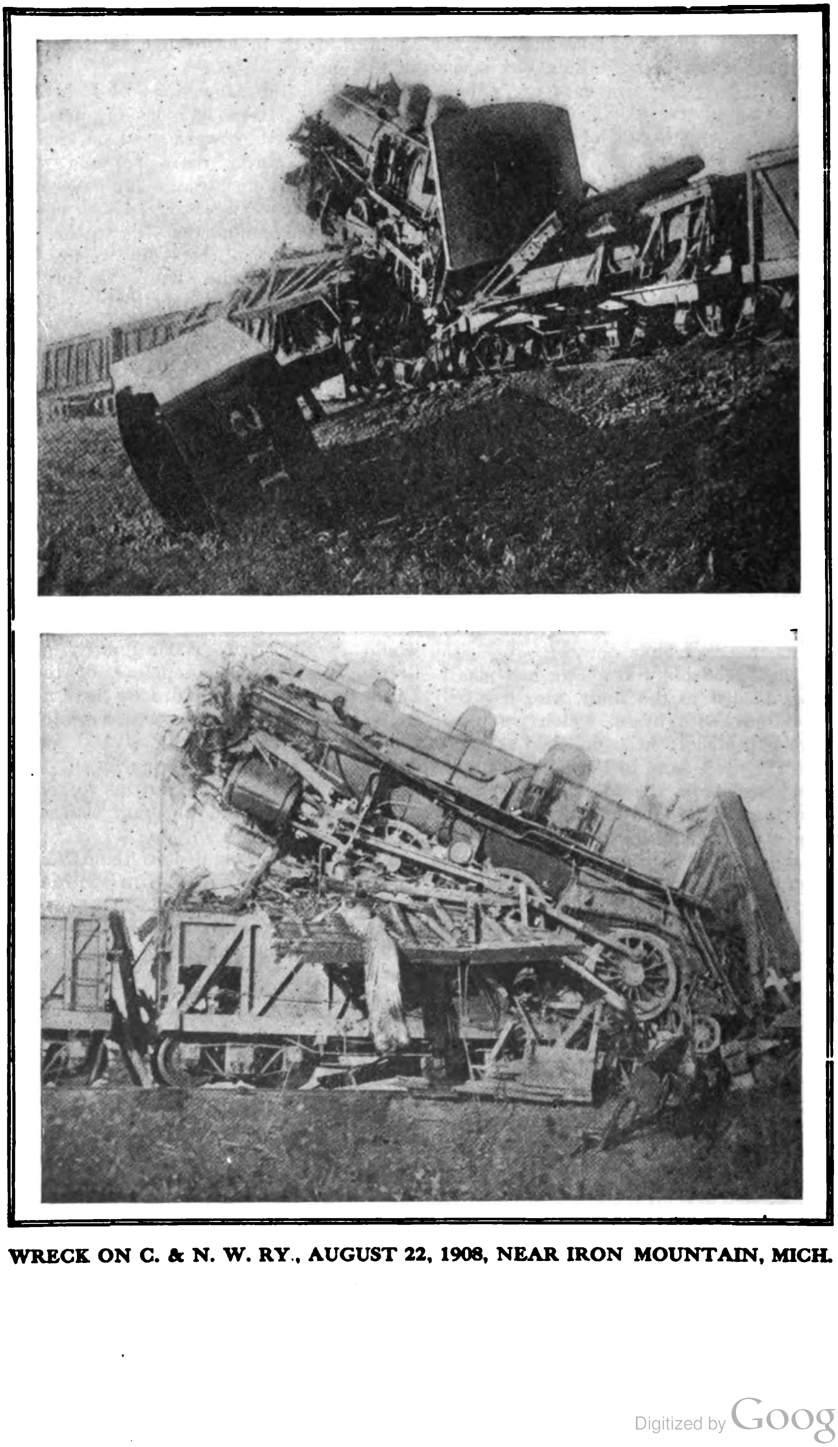

WRECK ON C. & N. W. RY., AUGUST 22, 1908, NEAR IRON MOUNTAIN, MICH.

Technical Contributions

WHY THE WHEELS STOPPED TURNING
(BEFORE THE TRAIN STOPPED)
OR
THE MYSTERY OF THE SLID-FLATS*

BY WILL W. WOOD

"All trains are rated to heavier tonnage beyond that hill, you know, and at Hamlet we picked up 10 more cars; they cut off the engine, went in the siding and found that the local had the cars switched out together for us, and the boys were going to hustle them out on to the train before they coupled up the air hose, and in that case you can't get an application for test on the picked-up cars unless you wait some time for their auxiliaries to charge—which usually they *don't* wait; so I got them to cut in the air before they pulled out from the siding, and by the time the train was coupled together the fresh cars had about the same air-charge as the others.

"And it was well that we were able to make a test application on the picked-up cars. Remember," said the instructor, "the proper answer to 'how is the air brake applied?' is not simply 'by reducing the brake-pipe pressure,' but 'by reducing the brake-pipe pressure *to less than that of the auxiliary reservoir*,' and you must have your auxiliaries pretty fully charged, or else draw off nearly all of the brake-pipe pressure in order to make the brakes set on the newly taken-on cars.

"But first to attract attention was a fierce blow of air from the triple-valve union of the brake-pipe branch, or crossover pipe, under a box car loaded with grain. The conductor sent Micky to the engine for a large monkey wrench; 'tighten that leak in the pipe union, Micky,' said the conductor; but Micky had evidently heard of trades unions, and knew what a scab was, for he replied:

" 'Is it a plumber I am, to be fixin' the pipes?'

"But after it was explained that tightening leaks in the air-brake equipment is one of the trainmen's duties, and the monkey wrench one of the working tools of his modernized profession, Micky got busy on the union; he tightened it, but that didn't entirely stop the leak, for at some time the hose coupling at one end of the car had been permitted to pull apart, and before they separated the brake pipe was pulled out a few inches at that end of the car, and drawn in an equal distance at the other end; this had slewed the crossover pipe at an angle that had cocked the union swivel so that no amount of tightening could make the union absolutely free from leakage; but it was so far reduced that I was for letting it run cut in.

"The air was applied for test and everything responded all right on the picked-up cars, and at the signal the engineer released the brakes—on everything but one of the stranger cars—a car of live stock next to the grain car; according to custom, Micky pulled the release rod—held the release valve open until the escaping pressure was weak, but the brake refused to release.

" 'Defective triple,' the conductor announced; 'cut 'er out, Micky, dear, and take out the oil plug from the brake cylinder,'

"Now, there is where Micky acquitted himself with honors, as you shall see," the instructor continued; "he reversed his instructions and removed a 'plug' first, but the one that caught his eye was the small, ⅜-inch plug in the side of the triple valve opposite the retaining-valve pipe connection, and when Micky took it out the brake-cylinder pressure escaped there in the normal way, the piston moved back into the brake cylinder and all was serene; two birds with one stone, as will appear.

" 'Oh, shoestrings! Whinell didn't I

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*Continued from the April Magazine.

thinka that,' exploded the con. 'Retainer's up; that's all.'

"But the retaining-valve handle wasn't turned up; I explained to him that the pipe to the retaining valve was stopped up, probably at the elbow at the end of the car; or wasps may have built a clay nest within the large exhaust port in the back of the retaining valve. With the pipe disconnected everything was now all right.

"But suppose that the air had not been cut in to the picked-up cars before pulling them out of the siding, and their brakes had not applied at the test, as the consequence; there would probably have been a case of slid-flat wheels, and an engineer falsely accused. Or, suppose that Micky had directly obeyed orders and taken out the oil plug, and cut out the brake on that car of stock; the results would have been of more moment than the conductor could have realized, as you'll see later.

"Remember, these cars were taken on at the head of the train. Before leaving that station the conductor cut out the brake on the grain car on account of the leaking union which, as he said, was too fierce to be in connection with 64 other cars with more or less unpreventable leakage. This car was just ahead of the stock car, and next ahead of it was another car that was already non-air—brake cut out and defect-carded; then, ahead, came the locomotive tender, while behind the stock car came next a car with some kind of a freak triple-valve and on that account, no doubt, the brake was also cut out on that car. But as it was—thanks to Micky's mistake—there was not more than two cut-out brakes together, although the locomotive brake was the ET No. 5, without any emergency valve for the venting of brake-pipe air on the tender. Otherwise, in connection with the latter feature there would have been four non-quick-action—or, rather, non-braked—cars together; and if the engineer had attempted an emergency application it is unlikely that serial quick-action would have ensued on the cars forming the main portion of the train, with the disastrous results that invariably follow to a long train if the speed is not too low—telescoping, and 'buckling' if on a curve.

"From Hamlet to Fiddler's Green there's a gradual drop in the grade—a race track of nine miles. A half-mile down the grade from Hamlet the engineer had to pinch them up with the air on account of a slow order over a bridge; past there, he 'took the halter off,' and when we stopped at Williamsport for the order board, the brake was found stuck on that cut-out grain car with the result of three pairs of flat wheels, although they hadn't been sliding very far, as the spots were not large and the wheels were not very hot.

"Yet that brake had been cut out," the instructor observed. "Suppose that I hadn't been present as a witness, and they had cut the brake in at once at Williamsport, and laid the blame upon the engineer. The cause was conjointly the slight leak at the triple valve union, a very leaky cut-out cock, and a pretty well worn triple-valve piston packing-ring; this is the car that the oil plug *should have* been removed from—after cutting out the brake—and so have prevented the trouble. The active cause was in the auxiliary reservoir charging through the leaky cut-out cock, and the brake applying through the same leakage when a brake-pipe reduction was made, assisted by the leak from the triple-valve union—although the same results can occur without any leak to the atmosphere between the cut-out cock and triple valve; the reason why the brake failed to release when the brake pipe was recharged was that the brake-pipe pressure could not feed through the leak in the cut-out cock any faster than it could feed past the leaky triple-valve piston, or escape to the atmosphere at the leaking union.

"There was one more incident of the trip," continued the instructor; "an extra freight running ahead of us broke in two and their hind man flagged us violently on the curve below Sundown; the engineer gave her the emergency, and the quick-action of the train brakes that were cut in was instantaneous, and without serious shock. But if Micky hadn't made that mistake there would have been an *accident* instead of merely an incident.

"I have given you some of the most common causes of wheel-sliding and flattening, but there are those in which it is hard to state the cause," the instructor told us. "There are a great many strange influences at work when a car is running; the length and angle of suspension of the brake-beam hangers play an important part in the transmission of power; the bunching or stretching of the running train when brakes are applied tends to raise the weight from one pair of wheels and throw it on the other pair, and to lift or depress the ends of the car by drawbar contact. Then, again, while a car is in action there is a rise and fall on the springs, and the bouncing over switches, that alternately decreases and increases the effective weight of the wheels upon the rails; a streak of white frost, a dash of rain, or a drop of grease on the rail.

"The difference in the total area of bearing surface of the two brake shoes of any one pair of wheels from that of the shoes of other pairs on the same car creates a difference of braking power," was the concluding item of the instructor's discourse. "It is a matter of argument whether large brake shoes or small makes any difference in the braking effect, under the same brake-beam pressure, many men claiming that it does not. But it certainly does; if the brake-shoes should be removed from a car, an application of the brakes would press the brake heads against the wheels with the same force that had been given to the shoes—at the same piston travel—but there would be comparatively little retardation of the wheel speed, owing to the lessened frictional area; when wheels are skidding the rails become the brake shoes, and *the braking power* is then 100-per cent. of the weight of the car, or locomotive, as the case may be, yet the area of frictional contact is so small that the braking effect is at the minimum; giving rise to the saying that if your drivers begin to skid when you are 'nearly into something' it is time then to get off."

There wasn't much of a technical nature in the instructor's talk on the slid-flat wheel problem, and it was the first time I had ever heard an air-brake sharp lecture on that subject to a gang of us common firemen and engineers that we weren't first put under the spell of mystery by allusions to "co-efficient of friction." Our air-brake boss didn't co-eff once, but the boys all saw the points that he brought out—on a mighty timely subject, too.

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ELECTRICAL RAILROADING

BY ELWOOD GRISSINGER

Short-circuited or reversed coils in an armature, and sometimes referred to as a "cross," are a frequent source of trouble in railway operation. They evidence themselves by the motor drawing excessive current from the mains, and by the further fact that the short-circuited coil will heat much more than others. Such a coil will burn out if it is kept running for a short time because of the excessive current taken as a motor or because of the heavy current induced in it in the case of a generator and which current is short-circuited in the coil and does not pass into the external circuit.

If a piece of iron or steel is held in the hand and between the field poles of a motor or a generator when the armature is revolving, the passing of the armature slots or teeth will be felt as feeble but regular pulsations. If, however, there is a short-circuited coil in the armature winding, then every time such short-circuited coil passes by the piece of iron or steel held as above stated it will cause an increased pull upon the iron and this will be manifested by a sort of a "jerk." This will occur once in each revolution. If more than one coil in the armature is short-circuited, this effect is more noticeable and the armature will revolve more slowly in the case of a motor and with an irregularity.

Such short-circuited coils are sometimes caused by solder or other metallic substances bridging the commutator segments or the leads attached to the commutator, in which event the trouble is easily corrected. If the short-circuited coil is defective in the body of the coil, which is much more frequently the case, then the only remedy is to remove the coil from the armature and insert a new one. A defective short-circuited coil can be located after a few minutes' run by the excessive heat generated in it.

Excessive heating of any of the parts of motors or generators is to be avoided. All of the standard makes of equipment are supposed to operate continuously at normal rated load without the temperature of any part showing a rise of more than 50 degrees centigrade above the temperature of the surrounding atmosphere. More frequently this temperature rise is limited to 40 degrees centigrade instead of 50 degrees. This temperature regulation applies to all classes of electrical equipment except street railway motors, because such motors are completely enclosed and therefore do not have the ventilation which is accorded to other types of motors; and because, also, of the fact that street railway motors are called upon to develop much more power at times than is their normal rating. Street railway motors are not rated with respect to a fixed temperature rise, as they never operate continuously at a fixed load. They have certain temperature characteristics which are dependent upon the conditions imposed.

The heating of the coils on the pole pieces or field magnets of motors and generators may be due to the presence of moisture within the coal and among the turns of wire, to an excessive amount of current in the field circuit, or to induced electrical currents in the pole pieces alone. The induced currents existing in the pole pieces have been termed Foucault or Eddy currents from the name of their investigators.

When field coils run hot because of the presence of moisture, their electrical resistance will test out lower than they should for that type of machine; when hot, steam may rise from them. Should this condition be found at any time, the coil or coils should be dried out carefully. This can be done in an oven adapted to the purpose, baking the coils for 48 hours or more at a temperature which will not injure the windings in any way or tend to carbonize the insulation of them. If an oven is not available for the purpose, then the same result can be accomplished by passing a current of electricity through the coils for a period of time sufficient to remove the moisture. The strength of this drying current can be regulated by means of a resistance so that with the aid of a thermometer (graduated in centigrade degrees) the temperature of the coil can be kept uniform and not allowed to exceed a temperature rise above the temperature of the surrounding atmosphere of more than 60 degrees centigrade. Moisture can be driven from any winding in this manner if the current be kept on for a sufficient length of time and care be exercised that too much current is not allowed to flow through the coils being treated.

The field coils may become heated without showing the presence of moisture. In fact, the absence of moisture is the rule rather than the exception. As long as one can bear the hand upon the heated coil there is nothing to fear from that coil; but when its temperature becomes so high that the hand cannot be held in contact with it, then the temperature should be measured and the true conditions ascertained. The prime requisite in taking temperature by thermometer measurements is a reliable, correct and accurate thermometer. The thermometer should be laid upon the part to be tested and covered thoroughly with clean waste. The thermometer should be watched and readings of it taken at intervals, until it is noted that the mercury has gone as high as it will under the conditions. A reading must also be taken of the temperature of the surrounding atmosphere. The difference between the two readings will show the rise in temperature of the part under measurement. If this rise in temperature shows it to be more than 50 degrees above the atmosphere when the machine is operating under normal conditions, it then becomes necessary to correct an obvious defect. The heating may be due to the fact that too much current is flowing in the field circuit because the voltage is too high or the resistance in series with the field coils is too low. A remedy for these two causes is had in a proper adjustment of the field resistance, either with respect to the field coils themselves or with the field circuit resistance exterior to the coils.

Compound-wound motors or generators may show heating in the fields coming from either the shunt winding or the series winding or from both. An examination of the coils comprising the shunt field circuit may reveal the fact that one of the coils runs cooler than the other, in which event it is reasonably safe to assume that the cooler coil is wholly or partially short-circuited in its winding. Such a condition would mean that its electrical resistance was lower than that of the other coils in the field circuit; and that the total current flowing in their circuit would be greater because of this lowering of their electrical resistance of the field circuit. The short-circuited field coil would run cooler because there would be a smaller number of turns of wire in use, and therefore a smaller amount of energy dissipated as heat from the remaining active turns. Such a coil may also be located because its pole would show a weaker magnetic field on account of the smaller number of ampere turns. A short-circuited coil may also be located by resistance measurement, a simple method for which measurement has already been described. A measurement of the electrical resistance of each field coil should be made. The calculations resulting should show the electrical resistance of each coil to be approximately the same. If any one coil should differ in resistance more than four or five per cent. from any of the others, then that coil should be removed and examined, repaired or rewound.

It is important that the electrical resistance of all field coils upon the same machine should be approximately equal. Differences in one coil alone might not cause any serious difficulty in operation except when a machine must be run at a heavy load for a considerable period of time. This applies to direct-current machinery, for a different result may evidence itself if a field coil is short-circuited on an alternating-current generator. A short-circuited field coil in such a case will act the same as a closed winding on an ordinary static transformer. The induced currents in such a coil resulting from the armature magnetic lines of force would soon burn it out.

Short-circuited field coils do not evidence themselves with perplexing frequency. Machines as now constructed are able to stand up under very severe operating conditions, and short-circuited field coils are not likely to be shown unless the machinery is abused, becomes watersoaked at one or more points, or lightning or static discharges break through, causing temporary grounds, which may develop short-circuited windings.

The Eddy or Foucault currents referred to and acting to cause heating in the pole tips or pole faces is something not uncommon in some types of machines. It is a defect of design and not of operation. Its effect is noticeable by the difference in temperature between the iron constituting the pole piece and the winding on such pole. This may be noted more frequently in rotary converters than in other types of equipment. Such heating may, however, though seldom, be caused by fluctuations in the armature current, if such fluctuations are persistent and rapid. An ammeter in the armature circuit would show whether such fluctuations were present in such degree as to cause objectionable heating.

In the case of heating in the series coils of compound-wound machines, the simplest corrective remedy may be found by providing means for shunting some of the current away from the series winding. Nearly all compound-wound generators are equipped with adjustable shunts attached to the terminals of the series coils, by means of which the strength of current flowing through the series coils can be altered within certain limits. This facility is afforded, however, for the principal purpose of changing the degree of over-compounding which it is desired that the machine should have. Where this degree of compounding must be maintained at a certain minimum value and the series coils would still run too hot, then nothing can be done other than rewind the series coils with the same number of turns of heavier wire. This will give a lower electrical resistance in those coils, a greater radiating surface for the dissipation of heat and a slightly smaller total waste of electrical energy in the form of heat. Generally, these features are those of design and are not likely to be met with in the practical operation of equipment.

A very common annoyance and difficulty in the operation of all classes of direct-current machinery is that pertaining to the heating of the brushes or of the commutator or of both. Of course, if the one should heat from any cause, the other is sure to do likewise for the reason that they are in physical contact with one another. Such heating may result from any one of half a dozen or more causes, irrespective of the sparking which has been the subject of a liberal discussion in a previous paper. The heating may come from brush friction on the commutator because of too much spring tension applied to the brushes or because of a very high rotative speed of the commutator. Naturally, the more slowly an armature revolves the greater the pressure that can be given to the brushes. The reverse must be true with the higher speed machines. When heating due to these causes is determined, then it is easily corrected by reducing the speed of operation or by reducing the pressure of the springs which bear upon the brushes and keeping the commutator clean but lubricated sparingly with vaseline or oil.

A commutator will heat very rapidly if there be any arcing across the insulation between the cummutator bars or between the bars and the end rings of the commutator. This defect will show itself in the form of burned spots between the commutator segments, and very often sparks will appear on the surface of the commutator between brushes when the machine is running. These sparks appear to be on the commutator surface, but are in reality in the insulation between adjacent bars. These sparks evidence themselves at such points because some conducting particles become embedded in the insulation. Such particles may be small copper filings and chips which were brushed or pressed in during the operation of turning down or finishing off the commutator. The remedy is to carefully clean the commutator at the points showing burned spots, and remove any conducting particles which may bridge the space.

Sometimes, the carbon brushes become overheated sufficiently (particularly if they be an inferior grade) so that they decompose somewhat, showing a thin film of black carbon coating on the commutator surface. The presence of such a film increases the electrical resistance between the commutator bars and the brushes, causing a heating of the parts. A careful cleaning should be made, new brushes inserted and carefully fitted to the surface of the commutator so that they will make a uniform and good contact. The fitting of the brushes to the commutator should always be carefully done. Brushes that have a thickness of a half an inch or more should be given a concave surface where they bear upon the commutator. With a brush that makes a true radial contact, the fitting is best done by placing the brush in the holder and grinding it into a concave shape by placing sandpaper between it and the commutator. Then by drawing the sandpaper back and forth, keeping the smooth surface of the sandpaper in contact with the commutator surface, a good fitting contact can be given. If the brushes bear tangentially upon the commutator, the operation is facilitated by first filing the brush to the proper angle and finishing off with sandpaper as just described.

An imperfect connection of a lead fastened to the brush holder terminals, which lead carries the armature current, will cause excessive heating at the joint and this heat will quickly radiate through the commutator and the brush holder. These leads are usually sweated into lugs for the larger sizes of machines and it not infrequently happens that such operation has not been done properly. Upon the smaller sizes of machines, the connections for the armature leads are made with a small binding post or with a small screw. This form of a connection may work loose and cause the same sort of trouble. At any and all points where an electrical circuit is broken and where a connection must be made, such connection must be positively made or loss of energy or heating may exist at that point. If such connection is made in the wiring external to the machine, the heat generated at a faulty joint may be sufficient to ignite inflammable substances in contact with or near enough to the joint.

Carbon brushes require much less attention than those made of copper, and for that reason they have practically displaced the last named, with a few minor and unimportant exceptions. A carbon brush will not of itself cut the commutator. Carbon has a much higher specific resistance than copper and this property of the carbon tends to reduce sparking between the brush and the commutator, which in the case of copper would probably be present to a considerable extent. The higher specific resistance of carbon also causes it to heat more than copper when an electrical current is passing through it. If the heating of the brushes is due to the brushes alone, they will show a higher temperature than their holders or than the commutator. This increased temperature may be due to a loose fitting carbon in the brush holder, or it may be due to a poor connection between the carbon brush and the flexible connections which are sometimes fastened to them. The heating may be due to the fact that the brushes are carrying away a heavier current than they were designed to carry, or that an inferior grade of brush is being used. It is poor economy to use a cheap or coarse grade of carbon for such work. In testing out for current carrying capacity, 40 amperes per square inch of contact area as between the brush and commutator is about the maximum current strength that it should be attempted to force through carbon brushes. Copper brushes have a current-carrying capacity far in excess of this amount.

When studying the excessive heating of any dynamo or motor, it is always well to begin the investigation by ascertaining whether or not the heated part has the heat generated within itself or whether its heat is the result of conduction and coming from some other part of the machine.

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THE FIREMAN'S DUTIES AND COAL COMBUSTION—II

BY W. L. FRENCH

Question.—What is meant by the term a heat unit?

Answer.—The amount of heat needed to raise one pound of water one degree F.

Question.—How can its equivalent be expressed mechanically?

Answer.—The power exerted to raise 772 pounds one foot high.

Question.—How many heat units does one pound of soft coal represent?

Answer.—It necessarily varies with the quality of the coal, so that a standard can hardly be fixed except for the particular coal tested. Ordinary grades of soft coal are presumed to evaporate 7 to 8 pounds of water per pound of coal. Hard coal runs about one pound less of water per pound of coal burned. A high grade soft coal that costs more per ton might be cheaper considering results than a cheaper but poorer grade of coal.

Question.—What is the effect on combustion of too little or too much air admission through a fire.

Answer.—Incomplete combustion. In the first place not enough air is admitted to keep the fire at its hottest. In the second place too much air is admitted and cools the fire, and in both instances the steam pressure falls.

Question.—How is the air admission controlled?

Answer.—By dampers that can be raised or lowered as occasion demands.

Question.—How is the draught on the fire forced?

Answer.—By the action of the exhaust steam from the cylinders escaping through the nozzles and out of the stack. Natural dràught would not nearly meet the needs of a working locomotive. The steam from the cylinders after performing its work there passes through the exhaust ports and goes to the base of the stand or nozzle pipes, which are smaller at the top than at the base, and leaving the nozzles is guided by the petticoat pipe in a straight line up the stack, as any defection from the perpendicular in either the stand pipe or petticoat pipe will divert the exhaust to one side and the engine will steam poorly. The smaller the nozzle tip opening, the stronger the exhaust works on the fire. Care must be taken that the opening is not so restricted as to prevent the free escape of steam, as otherwise the engine will work under back pressure and lose power.

The rush of exhaust steam up the stack creates a vacuum in the smokebox and at the same time draws heavily on the firebox to fill it, and this in turn causes the outside atmosphere to force its way through the fire and dampers. The size of the nozzle pipe must also be such as to suit the quality of coal being burned. It is evident that a soft free burning coal would not require as strong a draft, that is, as small a nozzle, as a hard, slow-burning coal would.

Question.—What is used to force the draught on a locomotive when steam is not being worked?

Answer.—The blower. This is a pipe extending from a globe valve which controls, or shuts off, the steam supply through it to the smokebox which it enters and is directed up beside the standpipe. The area of this pipe is restricted at the smokebox end to give greater force to a small steam supply.

The blower should be used as little as possible, and always used as moderately as possible. When the fire is being cleaned or removed from the box the strong rush of cold air through the fire door caused by a hard working blower is very injurious to flues and firebox sheets.

Question.—Is the practice of opening a fire door a good one?

Answer.—No. At important terminals, or when smoke obscures the vision or it is desirable to keep an engine from popping about station grounds, the door may be opened a little and when steam is not being worked the blower may be turned on lightly. Opening the door on a hard working locomotive injures the firebox and should be avoided.

Question.—What harm is done by air getting into smokebox through cracks, defective seams or holes in smokebox.

Answer.—The vacuum in front end is partly or wholly destroyed, the draught on the fire suffers in an equal degree, and the result is a poor steaming engine.

Question.—Is all heat generated in a firebox used to convert water into steam?

Answer.—No. There is much heat lost, although modern firebox construction has lessened the amount lost in earlier days. The rapid rush of unburned gases through the tubes is another cause of great heat loss.

Question.—How should air be admitted over the grate area?

Answer.—Equally. The front end should be arranged to this end, else combustion will suffer with any inequality of draught on the grate surface.

Question.—Upon what is draught dependent?

Answer.—The condition of the fire, ashpan, grates and dampers, the size of the nozzle tips, the front end arrangement and the point of steam cut-off, which also has a part in regulating the force of the exhaust. Sufficient air admission is as necessary to combustion as is a sufficient coal supply.

Question.—Is the proper mixing of the air and coal gases important?

Answer.—Yes. The mixing must come at the right time and place with the firebox at a high temperature.

Question.—What is the proper condition of the fire?

Answer.—A light fire is the only one to be carried in an engine to secure the best results. By this is not meant one that will not be heavy enough to stand the force of the exhaust for the work being done without tearing holes in it. Six inches of fire might be plenty at one time, while more would be needed under other conditions. But let it be fire, and not dead ash or clinkers, that hinders draught, and leave a coal space at the bottom of the firebox. The fire should be level and have no holes in it, as in the latter case cold air will cool the gases in the firebox below the igniting point.

Question.—How often should grates be moved to keep the fire light and clean?

Answer.—This is something that only experience and immediate conditions can determine. The fire from below should always look bright as seen through the grates and they should be moved often enough to secure this result.

Question.—What effect has fresh coal on the fire and the fire on fresh coal?

Answer.—In the first place the fresh coal cools the fire, and for that reason should be scattered over it as thinly as possible. In the second place the fire commences to break the coal down and the volatile gases are released, leaving the freed carbon on the grates. If the temperature of the firebox is high the gases are burned, if not they escape unconsumed to the atmosphere. They have no color when thus burning, but when not they form soot and pass off as black smoke. The coke lies on the grates until burned.

Question.—What is the effect of a fire being allowed to burn too low?

Answer.—The same as putting too much coal on the fire. The temperature in the firebox falls too low to ignite the gases, and yet is high enough to release them, so that there is a consequent waste of fuel. Cold air coming in and chilling the firebox sheets and tubes is injurious. A white hot fire, turning to red when fresh coal is thrown on, is the proper one for good results.

Question.—Will gases be burned after entering the flues?

Answer.—Not to any extent. The temperature is too low in the tubes to ignite the gases and it falls considerably toward the smokebox end. This is proven by the fact that flues seldom leak at the smokebox end, so that there is evidently but little change in the temperature of the flues at the smokebox end. With heavy gases in the tubes the amount of blaze that can enter a tube from the firebox end would be at once extinguished the same as a light is put out when lowered into a well heavily charged with carbonic acid gas.

Question.—To have a good fire on the road how should it be before leaving the terminal?

Answer.—In good condition. A bad fire to start with can seldom be made a good one on the road. The use of a fair amount of wood when firing an engine up in the roundhouse will prove to be economical in the end.

Question.—Is black smoke combustible?

Answer.—Yes, to a large extent. It is unburned carbon and can be largely consumed if the engine and fire are in good condition and the engine is properly fired.

Question.—Will observing the water level in the boiler aid a fireman in his work?

Answer.—Yes. He can gauge his fire accordingly.

Question.—Should the fire be allowed to burn too low with injector working?

Answer.—No. It cools the firebox too much.

Question.—If fire is too thin when starting a train what is the result?

Answer.—Holes will be torn in the fire, steam pressure will fall and fuel will be wasted. The chance of clinkering the fire is also good. If the engine slips with a thin fire, opening the fire door will save the fire.

Question.—Is it advisable to use a rake or a slash bar in a fire?

Answer.—It is not. It is likely to get green coal on the grates and cause them to stick, or clinker the fire. With a wide firebox it is harder to keep the fire well covered than with a narrow one, and the back corners should be especially well looked after.

Question.—Should coal be well broken before being put in firebox?

Answer.—It should. It ignites more quickly and burns more freely than when in large lumps, the same as a small stick will burn more quickly than a log. The coal can also be placed more evenly on the fire and there is less likelihood of holes in the fire.

Question.—Is there any advantage in wetting the coal on the tender?

Answer.—It keeps down the dust but is no aid to combustion.

Question.—Has a large grate area any advantage over a smaller one in the way of combustion?

Answer.—It has, by permitting a larger surface for the air admission and the draught does not need to be forced so hard.

Question.—Does a full ashpan injure combustion?

Answer.—It does, by retarding the air admission and also the fire cannot be kept as light as it should be. A pan should be kept reasonably clean at all times so that grates can be moved whenever necessary.

Question.—What is the gas called that is formed by the mixing of the air and coal gases?

Answer.—Carbon dioxide.

Question.—What are the most important things in combustion?

Answer.—The quality of the fuel, the air admission, the draughting arrangement and the igniting temperature of the fuel.

Question.—Why is the water distributed around the tubes, side and crown sheets of the firebox?

Answer.—To aid in generating steam more rapidly. It makes the heating surface in contact with the water much greater.

Question.—What are some of the prime causes of imperfect combustion?

Answer.—Not enough air admission, too heavy firing, dirty fire or insufficient damper opening. The latter is not liable to occur.

Question.—In what part of the firebox is the draught the strongest?

Answer.—In the corners and along the side sheets.

Question.—Has any other method of admitting air to the fire, other than through the grates, been tried?

Answer.—Yes. By means of hollow staybolts and by combustion tubes through firebox sheets from the atmosphere to inside of firebox. The hollow staybolt is but little used at present and the combustion tube is used more moderately than formerly. Too free a use of combustion tubes cooled the fire, causing a loss of heat which they were intended to overcome.

Question.—Aside from the proper mixing of the air with the fuel what other advantage is there in admitting air through the fire?

Answer.—It is heated before coming in contact with the gases from the coal.

Question.—What is placed in the firebox to aid in the mixing of the air and the coal gases?

Answer.—The brick arch.

Question.—What is it?

Answer.—A table of brick extending from side to side of the firebox and back from the flue sheet, for one-half (½) to two-thirds (2/3) the length of the box, low in front and sloping strongly upwards toward the rear of the box. An opening is left at the front of the arch between it and the flue sheet. The arch retards the escape of the gases, giving a longer time for them to be burned and, by being red hot itself, aids in keeping a high temperature in the firebox. After the fire is out the arch cools slowly and keeps the flues and side sheets warm for a long time, and lessens the likelihood of their leaking.

Question.—Are there any objections to the brick arch?

Answer.—The flues cannot be worked on to any advantage without removing the arch. Many roads do not use an arch in their large types of engines.

Question.—How does the fire appear when an engine is working hard and combustion is rapid?

Answer.—Like a miniature storm center, through the rapid in-rush of the air and the quick formation and burning of the gases which makes a series of small explosions. The chemical change of a pound of coal is almost too rapid for consideration. One is more apt to consider by the shovelful that is cast into the firebox.

Question.—What is the cause of an engine's drumming.

Answer.—The explosion of the gases in the firebox. Dropping the dampers or latching the door open will stop it. It is always an indication of a good fire on the grates.

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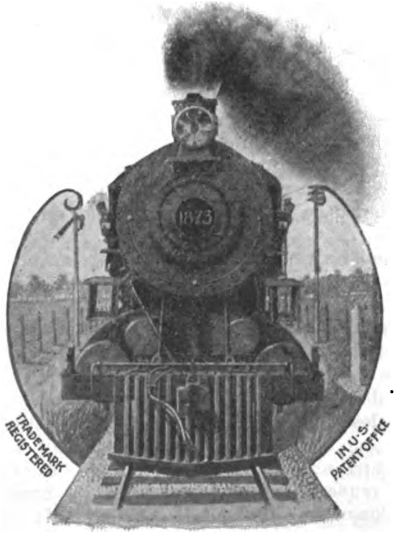

APPLICATION OF THE BILGRAM VALVE DIAGRAM TO AN ENGINE WITH A SHIFTING ECCENTRIC*

Before considering the application of the above diagram to an engine with a valve driven by a single shifting eccentric, it will first be necessary to inquire into the action of this type of eccentric, and afterwards to ascertain what similarity exists between it and two fixed eccentrics connected to a link. In this connection it will be proven that both mechanisms give practically the same results, and therefore any deductions that can be drawn from an examination of the former will also apply to the latter. In short, a study of this diagram applied to a moveable eccentric furnishes an easy means of investigating the complex action of a link motion.

Fig. 1 shows a shifting eccentric, *O* being the center of the axle and *A* of the eccentric. The engine is on the forward dead center, and the valve has been displaced from mid-position the amount of lap *AF*. Admission is about to occur, and it is obvious that any movement of the pin *D* to the right, would cause the valve to open the port, resulting in a motion as indicated by the arrow. It will be noticed that the interior of this eccentric has been cut away, permitting of a movement across the shaft, and if it were so moved until its center *A*, following the line *AB*, reached the point *B*, a moment's reflection will show that the pin must now be moved in the reverse direction in order for the port to open, the result being a backward movement of the engine. While a fixed eccentric permits of the engine moving in one direction only, a shifting eccentric permits of the motion being reversed. If no lead were originally given by advancing the eccentric on the axle away from the perpendicular line *CH*, it is evident that none would exist for the backward motion, with the eccentric center shifted on the line *AB* across the shaft. As the eccentric center approaches mid-position its throw decreases, while the angular advance increases; that is, when it is at *N* its throw is only equal to *NO*, while the original angle of advance *FOA* has now increased to *FON*. The effect of this on the four events of the valve stroke will be shown in the diagram. At present it will be sufficient to remember that the shifting eccentric not only furnishes a means of reversing the motion, but it also places the valve under a series of eccentrics of a shorter throw, and of a greater angular advance, as it is moved from either gear to mid-gear. When the eccentric center reaches the point *K*, midway between full gear ahead and back, it will be noticed that the throw has decreased until it is equal to the lap *AF* or *OK*, or, in this position were the engine rotated, the valve would only travel twice its lap. It should also be noticed that any movement of the eccentric center from its mid-position *K* towards *B*, will cause the direction of motion to be reversed.

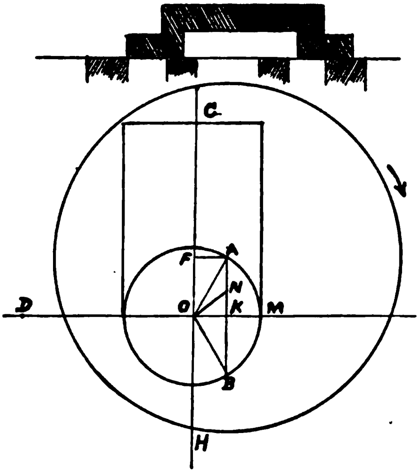

Fig. 1

Fig. 2 shows a type of shifting eccentric, which moves in an arc *AB* across the shaft instead of following a straight line as in Fig. 1. In this case the lead will increase, reaching its maximum at mid-gear. In all other respects its action is similar to the eccentric in Fig. 1, but the movement in mid-gear would be equal to twice the lap and twice the mid-gear lead. It should be noted that this eccentric is pivoted at *A'*, a disk being secured solid on the shaft for this purpose. A further study of Figs. 1 and 2 will show that if admission occurs at *A*, cut-off will take place when the eccentric center reaches *B*, or with the eccentric in this position, the valve is in the same position as at *A*, but is now moving to close the port, or during the admission of steam, the eccentric center, and also the crank pin, moves through a semicircle, less twice the lap angle, which would leave the pin lacking two lap angles of the back dead center at cut-off. The greatest port opening would be equal to the throw of the eccentric *OM* in Fig. 1 less the lap *OK*, or it would be equal to *KM*.

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*By J. H.

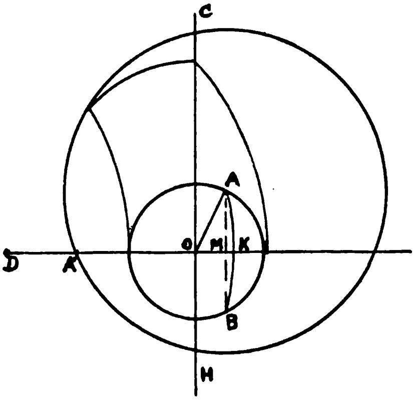

Fig. 2

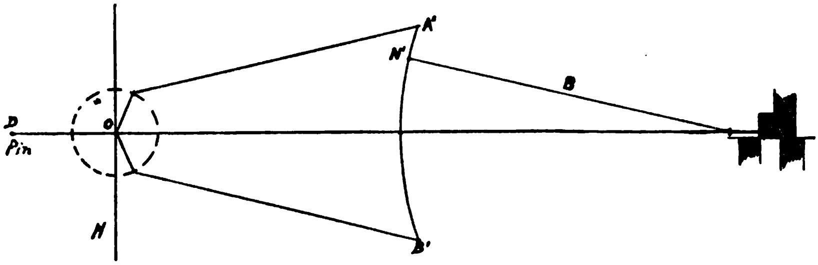

Fig. 3

While the shifting eccentric furnishes a means of reversing the motion, and while earlier types of steam engines have been fitted with such a device, its defect lies in the fact that it does not permit of a quick and convenient means of doing so. The invention of the link connected to one or two eccentrics secured rigidly to the axle places the engine under much easier control in this respect, and was an important factor in the development of the locomotive. It will now be proven that the link motion performs duties practically similar to those of the shifting eccentric. In order to show this the Gooch motion, with its stationary link, has been taken, as the selection of the Stephenson gear with its shifting link involves a more intricate proof. The simplicity of the former gear shown in Fig. 3, and which is largely used abroad, requires very little preliminary explanation, except that the link is stationary, merely swinging on a hanger, while the block is moved up and down in the link by means of the reverse lever. The radius rod *B* is attached direct to the valve stem. It is obvious with this gear, that the lead would be constant, and it will be proven that its action is practically the same as that of a single eccentric, moved vertically across the shaft, as in Fig. 1.

Fig. 4 shows this valve gear in skeleton form. It will be assumed that the angularity of the eccentric rods be disregarded, that is, that the horizontal movement of the eccentrics from *FH* is exactly the same as the horizontal movement of the link *A'B'* from *F'H'*, which is the position the link would assume were the eccentric centers placed at the center of the axle at *O*. The error in the proof lies in this assumption. Rotate the crank pin until the eccentrics are in the position shown. The link will assume position *A'B'*. Divide the line *AB* corresponding to *AB* of Fig. 1, in the same proportion as the link *A'B'*. That is, assuming *AB* is one inch long, and that *A'B'* is 3 inches, divide each one into quarters. Both lines being divided proportionally *AN* will be one-quarter of an inch long and *A'N'* three-quarters of an inch. From *AN* and *B* and *A'N'* and *B'* draw perpendiculars to the center line. Place the link block at *N'* in the link, or at one of the quarter divisions. Now if it be assumed as before stated, as the eccentrics are rotated, that the horizontal distance of their centers from the line *FH* will result in the link ends moving an equal horizontal distance from *F'H'*, then *OC* is equal to *O'C'* also *EO* will be equal to *E'O'*, or *EC* will be equal to *E'C'*. As *AB* and *A'B'* are divided in the same proportion, perpendiculars dropped from *N* and *N'* will also divide the two equal lines *EC* and *E'C'* in the same proportion, or *DC* and *D'C'* will be a quarter of the two equal lines *EC* and *E'C'*, or *DC* will be equal to *D'C'*. But as *EO* is equal to *E'O'* the remainder *OD* will be equal to the remainder *O'D'*. That is, with this gear, and with the link block at *N'*, and the eccentrics in the position stated, the block and valve will have moved a distance *O'D'*, but were it replaced by a single shifting eccentric, with its center moved to *N* and the points *N* and *N'* connected up, an exactly similar movement of the block and valve would be obtained, or they would move a distance equal to *OD*, which, as already shown, is equal to the amount *O'D'*, that the block has been moved by the link motion. That is, if the center of the eccentric in Fig. 1, were moved across the shaft to *N*, the effect upon the valve would be the same, were the eccentric replaced by the link motion in Fig. 4, with the reverse lever backed up until the link block was at *N'*. It is evident then that raising the block in the link is equivalent to placing the valve under an eccentric of a decreased throw, and of an increased angular advance. Therefore as the shifting eccentric and a link motion gives the same results, any deductions made from a study of a diagram applied to the former, will apply equally well to the latter. The action of the Gooch stationary link motion, due to raising the block in the link, is practically the same as that of the Stephenson shifting link gear, when the link is raised on the block, except with the latter increased lead is introduced, its equivalent, therefore, being an eccentric of the type shown in Fig. 2.

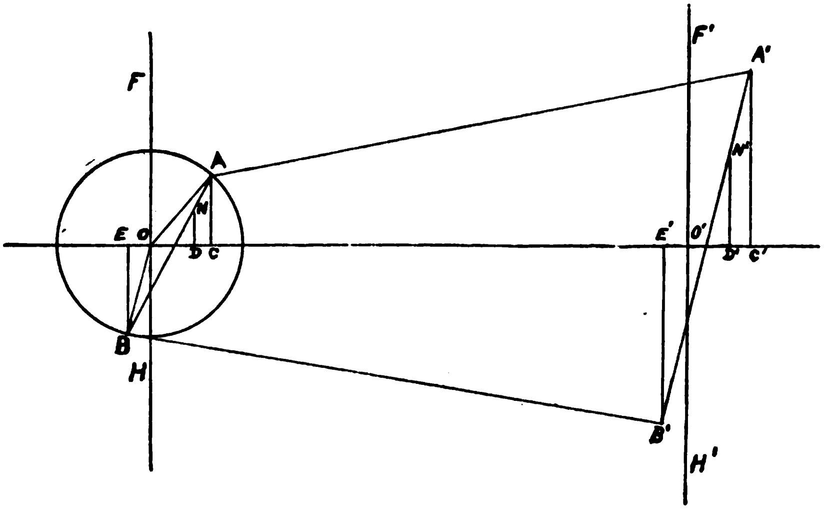

Fig. 4

Fig. 5 shows the diagram applied to this class of eccentric. *O* is the center of the axle and *A* of the eccentric. In moving across the shaft it will follow the arc *AKB*. Extend the crank arm *DO* to *F* and on it lay down the angle *F OC'* equal to the angle of advance *COA*. The student will remember that this diagram depends upon the fact that the perpendiculars let fall from the point *C'* found as above, on any crank position

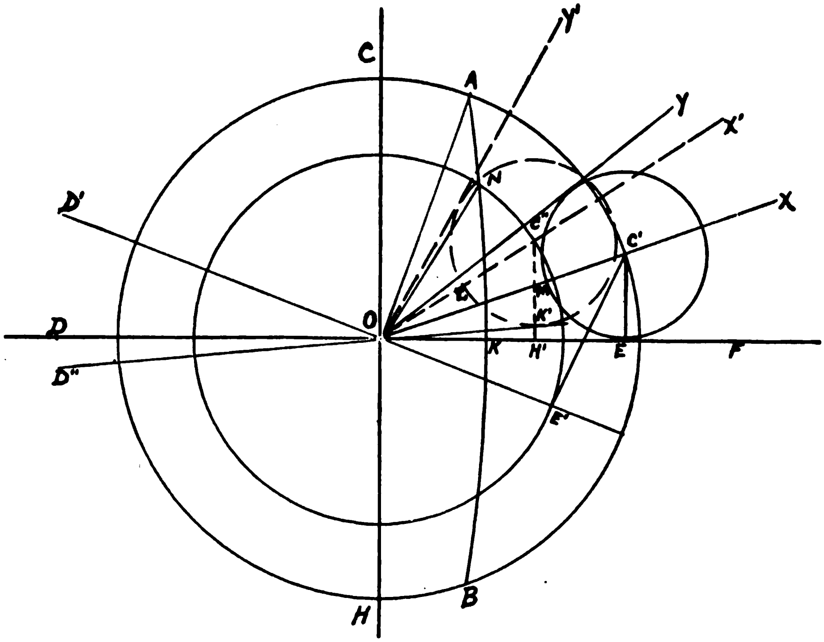

Fig. 5

DO, extended if necessary, equals the distance the valve has moved from mid-position, or the point *C'* may be regarded as the center of the valve seat, and the other point found by drawing a perpendicular to the crank arm is the center point of the valve. As the port opening is equal to the amount the valve has moved from mid-position less the lap, by describing a circle with a center *C'* and a radius equal to the lap, the remainder of the displacement will be equal to the port opening. The port opening for position *D'* of the crank will be *C'E'*. The engine and the diagram must not be confused. In the engine, when the crank moves, the eccentric and valve also move. Once the diagram is constructed, the only moveable quantity is the line *DO* representing the crank, the rest of the diagram remaining stationary. When the pin has turned to the right to *Y*, cut-off has occurred for the front port, as the pin now lacks two lap angles *YOX* and *XOF* of the back center. At *C'* the length of the perpendicular has reduced to zero, and the valve center is at no distance from the center *C'* of its seat, or is in mid-position, and release is about to occur for the right port, and compression for the left port. The position of the pin for the events of the valve stroke for this port has been explained in a previous article and may be found by extending the lines representing the events for the forward port, straight across the circle described by the eccentric center during its revolution. Now move the eccentric center to *N* and note the position of the pin for the four events of the valve. The throw of the eccentric has now decreased to *ON* and the angle of advance has increased to *CON*. Lay down this angle on the extended crank arm, and obtain the center point of the valve face *C'''*, and with a radius equal to the lap, describe the lap circle. Admission now occurs earlier than before, or when the pin reaches its dead center, the valve has the port open the amount of increased lead *K'H'*, it being assumed that no fixed lead exists, the valve being line and line in full gear with the eccentric at *A*. Cut-off will take place with the pin at *Y'* and release and compression at *X'*. Shifting the center of the eccentric nearer to the center of the axle, which is equivalent to drawing back the reverse lever, therefore, causes an earlier admission, cut-off, release and compression, or the pin and piston do not move as far before these events take place, also while *OM* is the greatest port opening with the eccentric in full gear, the maximum port opening with the eccentric at *N* is *OL*. A frequent criticism of the link motion is based on this reduced port opening and the earlier release and compression with the link hooked up. The inner circle will represent the path of the center of the eccentric with its reduced throw. *K* is now the center of the valve seat, and from this point describe the lap circle. Admission will not occur now until the pin is at *D′* or until it has passed its dead center. Cut-off will take place at *X″*, or earlier than with the eccentric center at *A*, but release and compression will occur with the pin in the same position as before, or at *X*. With admission taking place at *D′*, the engine would be useless, and in order that steam be admitted at the end of the piston stroke, the already decreased eccentric throw must be turned to *N*, thus increasing the angle of advance from *CON′* to *CON*. Lay down this increased angular advance *C″OF* and describe the lap circle from *C″* as a center. The order of the events will then be as follows: Admission will occur at *D″*; cut-off at *Y′* and release and compression at *X′*, which correspond to the same positions of the pin in Fig. 5, or in Fig. 5 an earlier admission, cut-off, release and compression have been secured, owing to the eccentric throw being decreased

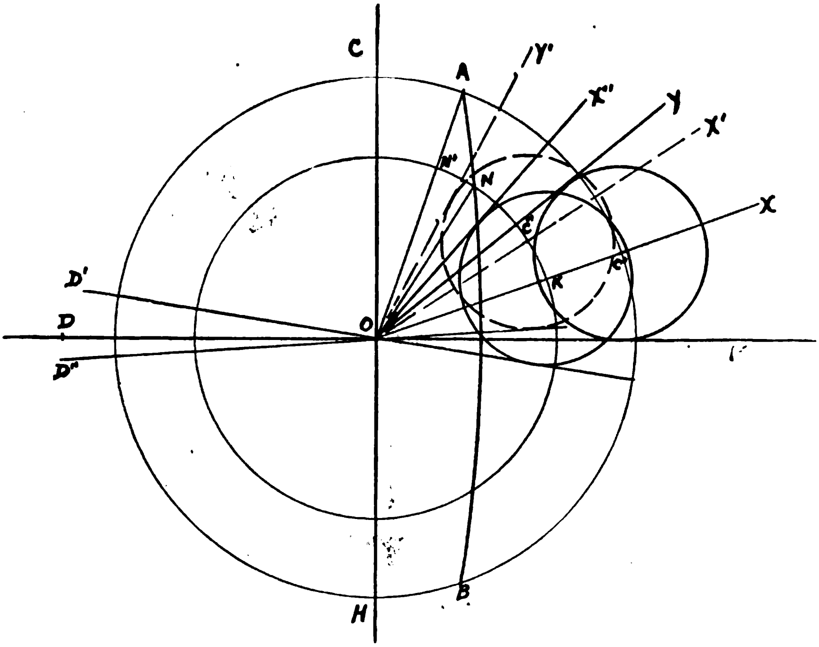

Fig. 6

The reason why the events of the valve stroke occur earlier as the eccentric center is shifted towards the center of the axle, or as the link is hooked up, will now be considered.

In Fig. 6, obtain the positions of the pin for cut-off, release and compression, as in Fig. 5, both figures being drawn to the same scale, with a corresponding lettering. Assume that the eccentric center is located at *N′*, thus decreasing the eccentric throw. It is obvious that the angle of advance *COA* or *CON′* remains unchanged, as will also the angular advance *XOF* on the extended crank arm.

to *ON*, and the angular advance being increased from *COA* to *CON*. Drawing the reverse lever of a Stephenson link motion towards the center is therefore equivalent to placing the valve under an eccentric of a decreased throw, and of an increased angular advance, with the results already stated. The statement frequently made, that the events occur earlier due to a decreased valve travel, which implies a decreased eccentric throw alone, is misleading.

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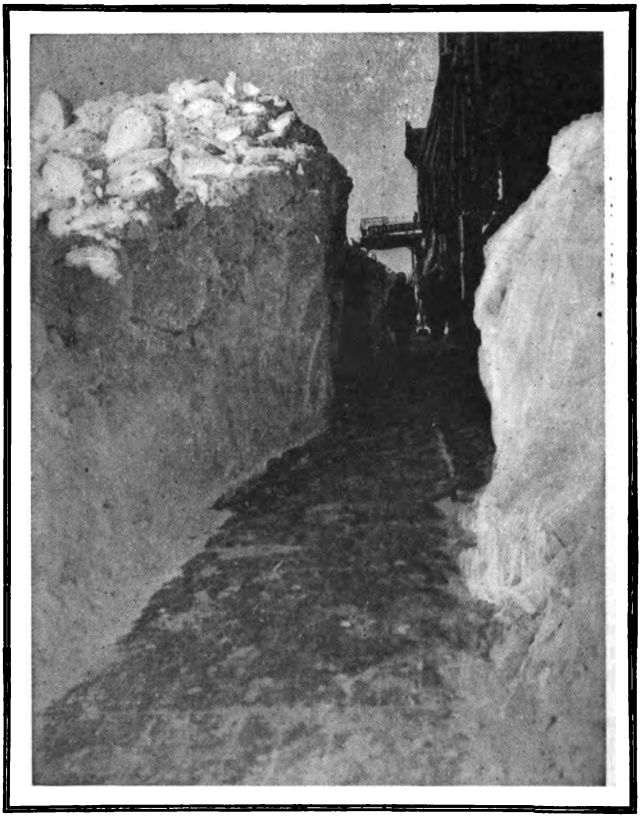

STREET SCENE AT SCOTLAND, SOUTH DAKOTA, FEBRUARY 18, 1909

MOVEMENT OF TRAINS

BY G. E. COLLINGWOOD

Train Rule Talks.

At the semiannual meeting of the Train Rules Committee of the Train Dispatchers' Association, which was held at Chicago, the matter of changing several of the standard rules was considered. We have repeatedly called attention to the confusion and contradictory statements contained in Rule 4, as revised in 1906, and at this meeting the matter was discussed and it was unanimously approved that the rule be amended to read as follows:

"4. Each time-table, from the moment it takes effect, supersedes the preceding time-table and its schedules take effect on any division (or subdivision) at the leaving time at their initial stations on such division (or subdivision). But when a schedule of the new time-table corresponds in number, class, day of leaving, direction and initial and terminal stations with a schedule of the preceding time-table, *it will take effect at once* and a train authorized by the preceding time-table will retain its train orders and assume the schedule of the corresponding number of the new time-table.

"Schedules on each division (or subdivision) date from their initial stations on such division (or subdivision). Not more than one schedule of the same number and day shall be in effect *on any part of a division* (or subdivision)."

The old rule states that when a schedule of the preceding time-table corresponds as to number, class, day of leaving, direction and initial and terminal stations, that such train would retain its train orders and assume the schedule of the corresponding number of the new time-table, but the rule failed to make the new schedule good; as the first sentence of the rule states positively that, time-table schedules will take effect at the leaving time at their initial station on such division. This, of course, refers to the leaving time after the time-table takes effect. The last paragraph of the rule also states in positive language that but one schedule of the same number and day shall be in effect on any division (or subdivision). In view of this fact if the rule was obeyed it would be utterly impossible for the train authorized by the old time-table to assume the new schedule, because the rule positively states that two schedules of the same number and date shall not be in effect on any division. The rule as amended reads "any part of a division," so that this misstatement of fact is overcome.

To authorize by rule, what is already a principle of practice, it was thought best to add a paragraph to Rule 220 stating the fact that when an extra train reaches its terminal all orders which it holds become void. For example, when a train has been run extra from A to C and upon arrival at C is directed to run extra from C to E, in case the extra with terminal at C should hold an order to meet an opposing extra at C, such order becomes void when they reach C, for the reason that all orders issued for a train are based upon the fact of the existence of such train. An extra train exists by authority of a train order giving it right to run from one certain station to another certain station. Such extra has no existence, as an extra, except between those certain points, and any orders issued to such extra are limited to the use of such extra, between such definite stations, and it follows that these orders must cease to exist when the train for which they were created ceases to exist. But in view of the fact that this question, in one form or another, is constantly arising the committee recommended that an additional paragraph be added to Rule 220 reading as follows: "Order held by, or any part of an order held by another train relating to, an extra train, become void when the existence of such train expires by limitation of time or place."

Because of the fact that it frequently becomes necessary to side track a superior train at the meeting point, the committee were unanimous in recommending that Form A should contain an additional example, with an explanation, stating that, "when a superior train is directed to take the siding at a meeting point, and such meeting point is afterwards changed it will hold the main track, unless expressly directed to take the siding there." Such a rule is necessary, for under the Standard Code when a train order or part of an order is once in effect it continues so until fulfilled, superseded or annulled, and in case trains have been directed to meet at a station and the meeting point is superseded, and no mention made as to which is to take the siding at the new meeting point that portion of the first order directing the superior train to take the siding for the inferior train would still be in force, and govern at the new meeting point. In considering this question it was thought best that should the meeting point be superseded, under such conditions, the side tracking provision should be annulled by a rule, for the reason that it might be very easily overlooked.

Form F as revised in 1906 is a great improvement over the old form used prior to that time, but there is still room for improvement and the committee recommended a second example of (1) providing for signals being carried to an intermediate station, thus: "Eng. 20 display signals and run as first No. 1 A to G." The committee also recommended a second example to (2) supplementing the foregoing, thus: "Engine 25 run as second No. 1 A to G and as No. 1 from G."

In view of the fact that Form F, example 9, provides for one section passing another, but does not provide that these sections must change any train orders which they hold, the committee were unanimous in the opinion that in order to safeguard such movement the explanation to (9) should read as follows: "Under (9) Engine 99 will run ahead of Engine 25 H to Z, both engines exchanging train orders and arranging signals accordingly. Following sections, if any, need not be addressed."

We wish to call attention to another defect in Form F and that is, the form does not furnish an example to withdraw a leading section. Example (6) can be used to drop out an intermediate section, but can not be used for a leading section.

In view of the fact that several accidents have occurred when a Form J order has been used it was recommended that the following paragraph should follow the words "—— may go" in form J: "'And when a train is thus permitted to go the operator will continue to hold all other trains, directed to be held, until they are severally permitted to go, or the order to hold is annulled."

This committee has had under consideration for some time a "schedule fulfilled" signal and also an "Identification" signal, but action on these signals was deferred until the next meeting, which will be held at Columbus, Ohio, June 12.

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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

751. Relief and By-Pass Valves.—"What is the difference between a relief valve and a by-pass valve? What is the use for both, and to what parts are they connected?"—*R. W. H.*

Answer.—A relief valve is a valve placed in the steam chest (usually screwed into the front end of chest) or into the steam channel for the purpose of overcoming the vacuum that would otherwise be formed in the cylinder as the piston moves forward and back, when the engine is drifting. (See Fig. 1.) It consists of an ordinary circular valve *A-A* having guide pins as shown, the main body *B* and the cap *C-C*, the cap having a seat on its under side as shown and perforations above for the admission of air. When the throttle is closed the valve *A* falls away from its seat, allowing air to flow into the perforations *D-D* or allowing any steam that might leak by the throttle to escape instead of remaining and condensing in the cylinder and steam chest. When the engine is drifting, air is continually being drawn into the steam chest through the relief valves, from whence it flows into the cylinder through the steam ports, and is expelled from the exhaust port, taking exactly the same course as is taken by the steam when the engine is working. As soon as the throttle is opened the steam acting against the lower part of the valve *A* seats it against the seat *C-C*, so that no steam can escape. A relief valve does not connect with or to any ports, but simply connects to the main steam cavity either in the steam chest proper or in the main steam channel. There are several forms of relief valves, but the most common is that shown in Fig. 1.

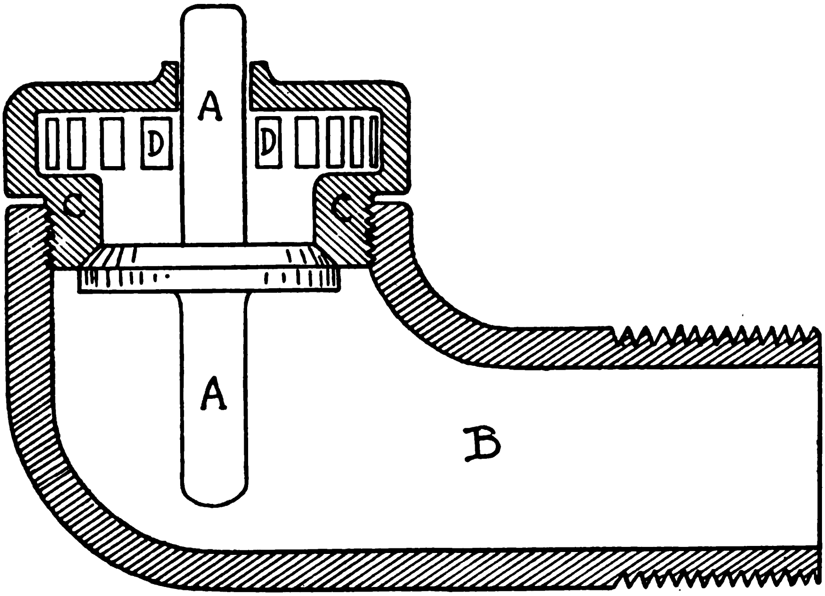

Fig. 1. Relief Valve

A by-pass valve is a valve also designed to overcome the vacuum in the cylinders when the engine is drifting and is most used on engines equipped with piston valves. Unlike the relief valve, however, the usual form of by-pass valve does not admit air from the atmosphere when the engine is drifting, but allows the air compressed in one end of the cylinder to flow into the other end of the cylinder through the steam ports and the main steam channel. In this way the air is simply "churned" back and forth between the two ends of the cylinder. Some forms of by-pass valves are also designed for another purpose, viz., to overcome excessive compression or to aid as a relief when working water. As a piston valve cannot lift off the seat same as an ordinary D or slide valve, if some means were not provided to relieve the cylinder when working water the probabilities are that the cylinder heads would be knocked out or the cylinder broken. Fig. 2 shows the construction of the ordinary by-pass valve, and the manner in which it performs both functions of a by-pass and a relief valve. The ordinary form of by-pass valve, as shown in Fig. 2, consists of the main body *D-D-D*, which communicates with the main steam channel and one of the steam ports in the valve chamber bushing, as shown. The body of the valve casting contains the circular check valve *A* working in a cavity in cap *E* and also on the lug or guide pin *C*. The purpose of the cavity in *E* and in the bottom of the check valve at *C* is to form an air cushion to prevent the check valve from slamming. When the engine is drifting the check valve falls away from the seat *B-B* by gravity, allowing the air compressed in that end of the cylinder to flow into the main steam channel and from there into the other end of the cylinder. When the throttle is opened, however, the steam in the main steam channel acting on the under side of the check valve *A* forces it to its seat, closing the communication between the steam channel and the steam port. When used as a combined by-pass and relief valve it is placed so that the port *F* engages directly with the steam port leading to the cylinder and between the cylinder and the main steam valve. The water or excessive compression then acting on the upper side of the check valve *A* forces it down against the steam pressure on its under side, thus relieving the cylinder. This form of by-pass valve is seldom used in this manner, however, water or high compression being usually taken care of by means of a pop valve screwed into each cylinder head. There are quite a number of different types and forms of by-pass valves, but the principle and operation of all is practically similar.

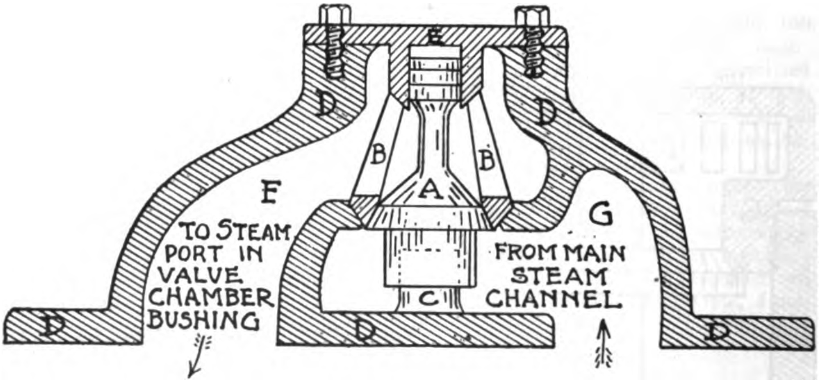

Fig. 2. By-Pass Valve

752. Balanced Slide Valve.—"What is a balanced slide valve? How is it balanced and why?"—*R. W. H.*

Answer.—A balanced slide valve is a valve which has been relieved of a part of the pressure acting on the top of the valve, or, in other words, a valve having part of its area cut off from the direct downward pressure of the steam in the steam chest, so that the downward pressure on the remaining exposed area is but little greater than the upward pressure of the steam in the cylinder acting against the under side of the valve; this upward pressure consists of the pressure of the live steam in one end of the cylinder, which acts against that part of the face of the valve covering the steam port, and the pressure of the exhaust steam in the exhaust cavity. There are two well known types of balanced slide valves, viz., the Richardson and the American. In both types the balancing is produced by cutting off such a portion of the area of the valve exposed to steam chest pressure that the product of the remaining area multiplied by the steam chest pressure is equal to the product of the cylinder pressure on the under side of the valve. In the Richardson valve this is accomplished by cutting grooves into the top of the valve, into which are fitted rectangular strips held up by means of springs, these strips bearing against the face of a flat plate, called balance plate, cast or bolted to the under side of the steam chest cover, the strips, called balance strips, making practically a steam-tight joint against the balance plate. In the American balanced valve the excess pressure is cut off from the top of the valve by means of conical circular discs cast or bolted to the top of the valve, over which discs are fitted spring snaprings, these rings being pressed against the under side of the balance plate by the action of the steam, thus making a steam tight joint on both the discs and the balance plate. With both types of balanced valves a small hole is drilled through the valve and into the exhaust cavity so that any steam that may leak by the balance strips or rings can escape through the exhaust. The object in balancing valves is to overcome the friction that would otherwise result if the steam pressure acted on the entire area of the valve.

753. Combination Boiler Check and Stop Valve.—"What is a combination boiler check and stop valve, and what are the advantages of it?"—*R. W. H.*

Answer.—A combination boiler check and stop valve is what its name implies, namely, a valve combining the features of both stop and check valve. The advantages of this type of valve are, that in case it is desired to grind in the check valve, it is not necessary to knock the fire and let the water out of the boiler, all that is necessary being to close the stop valve, when the check can be ground in. Another advantage on the road, is, in case the check valve gets stuck up, due to scale or other foreign matter getting under it, the engineer can close the stop valve and then clean out the check valve, or simply close the stop valve and go on using the other injector. Many engine failures have been caused on account of the plain check valve sticking up so that it could not be seated without knocking the fire and letting the water out of the boiler.

754. Loose Equalizing Pipe in Lubricator.—"Question 84 of the second series which were published with answers in the August, 1907, number of the Magazine reads: 'If an equalizing pipe becomes very loose or broken off, what would you do?' The answer reads, 'This pipe would have to be plugged where it enters the condensing chamber, and where it enters the feed arm. This would put that one feed out of service, but does not interfere with the working of the other feeds.' Our master mechanic, who examined me recently, told me that I could not do anything with it, that it put the lubricator out of service. Who is right?"—*R. W. H.*

Answer.—Viewed from the standpoint of practical railroading we would be inclined to say that your master mechanic is right, as while the job can be done by removing the condensing chamber and then plugging up the broken pipe, and in that way simply throwing that one feed out of commission, we do not think it would be advisable for an engineer to undertake it on the road. We would prefer oiling the valves through the auxiliary oilers or through the relief valves, and reporting the lubricator on arrival.

755. Check Valve in Connection with Feed Water Heaters.—"Having read several articles on 'Feed Water Heaters,' I think I understand their workings, but I never see a boiler check valve mentioned on that device. I cannot think that a check valve can be omitted with a feed water heater. Further, how does the feed water that loses its velocity lift the check valve off its seat and enter the boiler?"—*R. W. H.*

Answer.—You are correct in assuming that a check valve must be used in connection with a feed water heater, as without a boiler check there would be nothing to keep the water in the boiler, therefore all feed water heaters use a boiler check in connection. In reply to that part of your question in regard to how the check is lifted after the water loses its velocity due to the friction in passing through the heater, will say that in the smokebox type of heater, such as the Rushford, the check is usually placed at the admission end of the heater, which leaves the velocity of the water when it strikes the check the same as though there was no heater. With other types of heater, that is, waste steam heaters, a pump is generally used instead of an injector, so that the flow of water through the heater can be regulated slow enough to allow the water to take up as much heat as possible before it enters the boiler. Where a force feed pump is used the check is not lifted by the velocity of the water, but by the force or pressure behind it. Where an injector is used in connection with a "waste steam" feed water heater the check is placed at the discharge end of the heater, i. e., screwed directly into the boiler same as without a heater; the loss of velocity in this case is not sufficient to prevent the water from lifting the check, as a larger injector is generally used.

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756. Two Hands on Steam Gauges.—"Why are there two hands on a steam gauge, a large one and a small one?"—*C. A. L.*

Answer.—All steam gauges are not fitted with two hands; the double pointer steam gauge was a special design gotten out by the manufacturer. In this style of gauge the dial has an oblong hole cut into it at the top; through this hole is shown a certain figure which represents the pressure the engine should carry, or the pressure at which the pops are set. The long hand of the steam gauge points to this figure when the desired pressure is reached. The short hand registers any pressure there may be on the boiler by the other figures on the dial. This type of gauge was gotten out so that anyone could tell at a glance what pressure the engine was supposed to carry, as only that stated pressure was shown through the orifice in the dial. So far as the two hands are concerned, however, they are not necessary, only a convenience.

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757. Direct Motion Engine.—"Will you kindly let me know what is the proper definition of a direct motion engine?"—*J. McF.*

Answer.—A direct motion engine is one in which the motion imparted to the valve by the eccentric is not reversed by means of the rocker arm. In other words, an engine in which the valve moves in the same direction as the eccentric.

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758. Lap and Lead.—"Please explain the proper definition of the terms lap and lead. I have read lap and lead explained before in a prior issue of the Magazine but cannot recall the exact words?"—*J. McF.*

Answer.—Outside lap is the distance which the valve overlaps or covers the steam ports when the valve is in the center of the seat, or the distance the valve must move from its central position before the port begins to open. Inside lap is the distance the exhaust cavity of the valve laps over the inside edges of the steam ports. Lead is the amount of port opening when the piston is at the end of its stroke, or the distance the valve has opened the port before the piston starts on the return stroke.

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759. Broken Eccentric Crank or Rod, Walschaert Valve Gear.—"What would you do with a broken eccentric crank rod on a Walschaert geared engine?"—*R. R.*

Answer.—In either case remove the broken parts if they interfere, then disconnect the lift rod from the radius rod, blocking the link block in the center of the link by tying wooden blocks in the link slot, top and bottom of the block. This will give the valve on the broken side a travel equal to twice the lap and the lead, and will give you a port opening equal to the lead, allowing you to work the engine on both sides in either forward or back gear. Of course the engine will not handle a full train in this condition, as it will work in a very short cutoff on the disabled side.

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760. Broken Combination Lever, Etc., Walschaert Valve Gear.—"What would you do with a broken combination lever, crosshead bracket or connecting link, Walschaert geared engine?"—*R. R.*

Answer.—Remove the broken parts, disconnect the radius rod at the front end, fastening it up to any convenient point so it can swing freely. Use the firedoor chain if you have nothing else convenient to tie it up with. Now, if the engine has no indicator plugs or cylinder relief valves which can be removed to overcome the compression and to permit oiling the piston and cylinder, block the valve so it will leave the back steam port slightly open (you can tell when you have it open by opening the throttle slightly and opening the cylinder cocks and moving the valve until steam appears at the back cylinder cock) and proceed on one side. With the valve blocked in this manner you can oil the piston and cylinder through the lubricator in the usual manner. If, however, you prefer you can block the valve so as to cover both ports, slack off on the front cylinder head, placing a block between the cylinder head and cylinder to hold the head away, and oil through the opening so made. We are not in favor of taking down the main rod when it can be avoided, as in the first place it is a big job and, in the second place, in case you get stuck on the center on the good side it would be necessary to pinch the engine off, if the other main rod was down, while with the main rod up on the defective side all that is necessary is to shift the valve so that one port will be open and thus allow the defective side to pull the good side off the center, then move the valve on the defective side so as to cover the ports again and go on.

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761. Broken Radius Rod, Walschaert Valve Gear.—"What would you do with a broken radius rod on a Walschaert geared engine?"—*R. R.*

Answer.—Simply remove the broken parts in case they interfere and block the valve and oil the piston and cylinder as before stated. With the radius rod broken and removed the combination lever would have no fulcrum to act on, therefore the valve would not move.

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762. Cylinder Head Knocked Out, Mallet Compound.—"What would you do with a low-pressure or high-pressure cylinder head knocked out, Mallet compound engine?"—*R. R.*

Answer.—As all Mallet compound engines have the Walschaert gear, it will be understod in this and all other questions under this head that parts of valve gear referred to apply to Walschaert gear only, without further reference to type of gear. In case of low-pressure cylinder head knocked out, disconnect the radius rod, block the valve to cover the ports, and proceed. This will leave you three cylinders working. Take three-fourths of a train. With a high-pressure cylinder head knocked out, proceed to disconnect and block as above. In this case, however, it may be necessary to cut the low-pressure engine into simple, as the one remaining high-pressure cylinder will not be able to furnish enough steam to supply both the low-pressure cylinders. As in either of the cases mentioned the cylinder heads are knocked out, oiling the pistons is an easy matter.

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763. Broken Combination Lever, Mallet Compound.—"What would you do with a broken combination lever, high or low-pressure engine, Mallet compound?"—*R. R.*

Answer.—In repairing breakdowns to valve gear in a Mallet compound engine, each engine or rather each set of engines, the high-pressure and the low-pressure, should be treated as a separate and distinct engine. Therefore, any rules or methods that will apply in cases of valve gear breakdowns on ordinary Walschaert geared engines will apply to similar breakdowns on either of the high or low-pressure engines of a Mallet compound, the only difference being that where it is necessary to throw one high-pressure cylinder out of commission on account of some breakdown requiring the covering of the ports it may be necessary to work the low-pressure engines in simple position. Therefore the answer given in a previous question relative to method of procedure in case of broken combination lever with Walschaert geared engine will apply to either high or low-pressure engine under a Mallet compound.

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764. Broken Piston, Cross-Compound.—"What would you do if the high-pressure piston of a cross-compound is broken off the rod?"—*J. L. B.*

Answer.—As the chances are that when the piston broke off it took the front cylinder head out with it, all that would be necessary to do would be to remove such broken parts as interfere or are liable to do further damage, disconnect the valve stem on that side, cover the ports, and go on with the low-pressure side. Of course, it would be necessary to work the low-pressure side simple.

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765. High-Pressure Head Out, Cross-Compound.—"What would you do if the high-pressure cylinder head is blown out on a cross-compound?"—*J. L. B.*

Answer.—Proceed same as in case above. In both cases leave the main rod up.

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766. Separate Exhaust Valve Stuck, Cross-Compound.—"In the event of a separate exhaust valve failing to work when the throttle is wide open what can be done to assist it in opening?"—*J. L. B.*

Answer.—This question is not very clear, as our correspondent forgot to mention the type of cross-compound, but as the operation is nearly the same in the various types the same general rule may apply to the particular type he has in view. From the wording of the question it is assumed that the separate exhaust valve is stuck shut. This can be due either to the pressure or emergency pipe leading from the cab to the separate exhaust valve being clogged up, to insufficient air pressure, in case it is air operated, to leaks by the packing rings, or to the valve itself being stuck, due to gum or dirt. If any of the former causes the remedy is to open the pipe or increase the air pressure; faulty packing rings can only be cured in the shop. If the valve is simply stuck, due to gum, a sharp blow with a big block of wood on the end of the stem (if of that type) or on the valve chamber cap, will usually start it. The emergency cock in the cab is of course to be open. If it won't start, however, with throttle wide open (in which case it must overcome the receiver pressure in addition to the gum or corrosion), the only remedy is to close the main throttle until you can get separate exhaust valve open, then after you get it started give it a liberal dose of coal oil and work it a few times to get it thoroughly loosened up.

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767. Broken Transmission Bar, Cross-Compound.—"What would you do if a transmission bar were broken, right side or left side, on a cross-compound engine?"—*J. L. B.*

Answer.—As that would put the valve on the broken side out of business, all that would be necessary if on the high-pressure side would be to remove broken parts in case they interfered, cover the ports by blocking the valve central, slack off on the front cylinder head so piston could be oiled; that is, if engine had no indicator plugs or cylinder relief valves which would answer the same purpose if removed, cut low-pressure side into simple and proceed. If the transmission bar were broken on the low-pressure side proceed same as above (the low-pressure cylinder heads being always fitted with excess pressure valves which can be removed to oil piston and cylinder, making it unnecessary to slack off on the cylinder head for this purpose), only in this case the separate exhaust valve must be opened.

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768. Low-Pressure Cylinder Head Blown Out, Cross-Compound.—"If a low-pressure cylinder head on a cross-compound is blown out what would you do?"—*J. L. B.*

Answer.—Disconnect the valve stem on that side, block the valve so as to cover the ports, open separate exhaust valve and proceed with the engine working on the high-pressure side.

769. Cylinder Pops Blowing, Cross-Compound.—"In the event of a cross-compound beginning to jerk badly and blowing off at the pops on the ends of the low-pressure cylinders, where would you look for the trouble?"—*J. L. B.*

Answer.—This is due to excessive pressure in the low-pressure cylinder, and is generally caused by the reducing valve being either stuck open or leaking, allowing high-pressure steam direct from the boiler to feed into the low-pressure chest.

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770. Valve or Cylinder Packing Blow.—"How can a steam blow, by or under the valve, cylinder packing, or valve strips be distinguished and located?"—*J. L. B.*

Answer.—As a rule, a valve blow is a continuous blow; that is, it blows regardless of what cut-off the lever is placed in. For a running test watch the valve stem, or go out and place your foot on it; the stem that jerks or trembles will indicate the defective valve. For a standing test place engine on either top or bottom quarter on the side to be tested, place reverse lever in center of quadrant, set driver brakes, open cylinder cocks, and open throttle; if steam flows from either cylinder cock the valve is cut or defective. For valve strips the same indications apply for running test and is a reliable way to detect defective strips; for standing test leave engine in same position as for cut valve (either quarter) and after setting brake, opening cylinder cocks, throttle, etc., move the reverse lever about two notches ahead of the center, then move it two notches back of the center; if by this means you can shift the steam so that in one position it will flow from one cylinder cock and in the other position it will flow from the other cylinder cock, the balance strips are down on that side. Another test is, after the engine has been placed on the quarter on one side, driver brake set, etc., open the throttle slightly and move the reverse lever back and forth, being careful to notice how it handles, whether hard or easy; then place the other side of the engine on either quarter and repeat the performance, noting how the lever handles; whichever side is on the quarter when the lever handles hardest is the side that has the defective balance strips. To locate defective cylinder packing, place engine in same position as for valve test, i. e., on either quarter on side to be tested, but place reverse lever in either corner instead of on the center, open both cylinder cocks, set driver brake, and open throttle; if steam flows from both cylinder cocks the cylinder packing rings are defective. Test other side in same manner.

771. Steam Heat Regulating Valves.—"What would you do after coupling on to a train if you could not get steam to go through a Mason steam heat regulating valve? Also the Gold steam regulating valve? And also the Leslie?"—*J. L. B.*

Answer.—This question was fully answered on page 373, September, 1908, issue of the Magazine, Question 639.

772. Injector Failing to Lift Water Above Certain Steam Pressure.—"We have a number of engines equipped with Simplex injectors. They receive water from the tank through a syphon and are placed low so that the water will flow to them when the tank is full. The trouble is, they won't take up the water. There are various phases of the trouble; usually they fail to take up the water with a full head of steam, but work good with 120 pounds or less. The new tubes for them are made in the company's main shop. We have first-class water as a rule. Any light you can throw on this as to cause or possible repairs will be appreciated."—*H. M.*

Answer.—The fact that the injector works all right with 120 pounds of steam or less indicates that the trouble is not due to leaks in the syphon pipe or any of the feed pipe connections. The writer had an exactly similar experience some years ago with injectors having "home-made" tubes and it was found that through some error tubes of the wrong dimensions were being used, that is, what were practically low-pressure tubes were being used in high-pressure injectors. We believe this to be the case in the present instance, and would suggest that the mouth of the steam nozzle be opened about 1-64 inch, that is, the taper or bell mouth of the nozzle be enlarged that amount, or that the tubes be carefully measured to see if tubes of the wrong dimensions are not being used throughout.

773. Capacity of Monitor Injectors.—"I wish you would tell me how much water a Monitor injector No. 8 and also a No. 10 will feed into a boiler per hour?"—*W. J. H.*

Answer.—Depends on the steam pressure. The normal capacity of these injectors with 200 pounds of steam is 2,340 gallons for a No. 8 and 3,750 gallons for a No. 10 per hour.

774. Closing of Injector Overflow.—"Will you please advise me through our Magazine what keeps the water from continuing to come out of the overflow of the Monitor and Sellers type of injectors after same have been put to work?"—*A. B. R.*

Answer.—The overflow valve is closed by the atmospheric pressure on top of it holding it to its seat. The steam coming through the steam nozzle at a high velocity condenses when it comes in contact with the water flowing through the combining tube and thereby forms a vacuum in the injector. This vacuum, being below the overflow valve, causes the atmospheric pressure acting on top of this valve to seat it. When the injector is only primed the water does not pass through the injector at sufficient velocity to raise the boiler check, hence it must raise the overflow check valve in order to escape. After sufficient steam is admitted to the injector, however, through the steam nozzle to impart enough velocity to the water to lift the boiler check a solid jet of water is formed which passes directly into the boiler instead of through the overflow as before.

775. Broken Valve Gear, Balanced Compound.—"What would you do with a broken valve gear on a Great Northern balanced compound?"—*R. R.*

Answer.—This question is rather broad in its scope, but without going into minute details would say, where the same valve supplies steam to both the high and low-pressure cylinders on one side, if the defect or break-down was such as to prevent the valve from performing its functions, take down any broken parts that will interfere, disconnecting the valve stem if necessary, block the valve so as to leave the back port of the high-pressure cylinder open about 1-16 of an inch (you can tell when this port is open by opening the throttle just a little and moving the valve back until steam shows at the back high-pressure cylinder cock), disconnect and block the starting valve open on that side, take the relief valve out of front low-pressure cylinder head, and proceed on one side. Oil the cylinders through the lubricator in the usual manner, or, if necessary, pour a little oil into the low-pressure cylinder through the hole in the cylinder head where the relief valve was removed. All other or ordinary breakdowns to the valve gear on this type of engine can be handled same as on a simple engine.

776. Broken Main Rod, Balanced Compound.—"What would you do with a broken main rod on a Great Northern balanced compound?"—*R. R.*

Answer.—If you broke the main rod connecting to either the high or low-pressure piston, remove the broken parts, block the piston ahead as far as it will go, being sure to fasten it securely, and proceed with the three remaining rods. The engine will handle about two-thirds of a train.

777. Broken Side Rod, Balanced Compound.—"What would you do with a broken side rod on a Great Northern balanced compound?"—*R. R.*

Answer.—Remove the broken parts and take down the corresponding rod on the other side and proceed.

778. Broken Valve, Balanced Compound.—"What would you do with a broken valve, high-pressure side, on a Great Northern balanced compound?"—*R. R.*

Answer.—As the same valve controls the flow of steam into both high and low-pressure cylinders on each side it would be necessary to handle this case same as in case of broken valve gear, unless it was a Cole balanced compound, in which case the high-pressure valve could be removed, valve chamber cylinder head replaced, and engine brought in with but one valve and cylinder (the low-pressure) working on that side.

779. Fatigue of Metals.—"Will you kindly settle an existing dispute between several gentlemen of this section by answering the following question: 'Under the same conditions will a locomotive run as many miles continuously as when given regular periods of rest?' In other words, would an engine run as many miles during its life by running a certain number of miles each continuous day as it would if given a rest during one day in seven? I am aware that the molecules of the steel in car wheels become disarranged by constant use, and again return to their normal position when not running. Cutting tools, as planes and razors, work better when used occasionally than when used constantly, and the same I presume is true of an engine, and in order to settle the controversy we refer the question for your decision."—*A. T. B.*

Answer.—This is a mooted question and must be referred to higher authority than the writer; in fact, we doubt if there is any way to settle it except by actual test. While there is no question but that the molecules in iron and steel become disarranged through repeated shocks and strains, such as these metals are subjected to in locomotive practice, these shocks producing a certain degree of heat, imperceptible though it may be to ordinary observation, but existing nevertheless, there is a question as to whether these molecules will return to their normal position by simply being allowed a period of rest, or must be subjected to a reversal of the heat treatment which distorted them. It is simply another form of the old question as regards crystallization of metals, as, for instance, if a certain piece of iron is pulled apart in a testing machine, and shows a crystalline fracture, did the crystallization take place at the moment of fracture, or was it pre-existent? In the opinion of the writer, however, a certain restoration of the molecules in the iron and steel contained in various locomotive parts which have become disarranged in service will take place during stated periods of rest, and for this reason an engine receiving regular periods of rest should make a greater mileage before failure occurs than one that is run continuously. This theory also appears to be borne out in actual practice, judging from observed data, although as stated above no positive assertion to that effect can be made by the writer.

780. Bursting Pressure of Boiler.—"Would you please illustrate in your valuable Magazine the way to determine the bursting pressure of two stationary boilers of the same dimensions, assuming them to be simply as a hollow cylinder, one in an upright and one in a horizontal position? If there is any difference please explain.—*V. J. P.*

Answer.—There will be no difference in the bursting pressure, the same law holding good regardless of position. The following is the rule for finding the bursting pressure of a boiler such as mentioned. Rule: Multiply the tensile strength of the material by the thickness of the plate. Then multiply the result so found by the efficiency of the joint and divide by the radius of the boiler. To find the safe working pressure divide this result by the factor of safety, usually assumed as five.

STATIONARY ENGINE PRACTICE.

781. Riding Cut-Off Valve.—"What is a riding cut-off valve, and how would you fit one?"—*G. O. F.*

Answer.—A riding cut-off valve is a valve riding on top of another valve, the other or top valve, called riding cut-off, regulating the cut-off. In an engine of this kind the lower valve, which rests directly on the valve seat, has its upper side faced and ports cut through it so as to virtually form another or movable valve seat on which the riding cut-off valve works. The lower valve is usually set to cut off at about full stroke, the upper or riding valve varying the cut-off according to the speed, the variation being usually controlled by the governor. For instance, when starting and the engine moving slow, the governor will allow the riding valve to admit steam during the greater part of the stroke; as the speed increases the governor gradually shortens the cut-off according to the power required; in other words, the governor hooks the engine up automatically. You understand, of course, that no steam can pass through the lower valve except what is admitted by the upper or cut-off valve. The valve is fitted same as any ordinary slide or D valve, except as stated above; the lower valve forms the seat for the riding cut-off valve. The lap and lead are of course, predetermined by the designer or builder.

782. Setting a Riding Cut-Off Valve.—"If you set it to cut off at half stroke on the outward stroke, would it cut off the same on the return stroke? If it did not, how would you make it?"—*G. O. F.*

Answer.—If all dimensions are correct the valve should cut off the same at both ends of the stroke; in case it does not, however, the cut-off can be equalized by lengthening or shortening the valve rod as may be found necessary.

783. Too Much Compression.—"If you were running a riding cut-off engine that had too much compression, how would you alter it?"—*G. O. F.*

Answer.—One way would be to reduce the lead; if, however, the valve had excessive inside lap, it might be well to reduce this. An indicator would show exactly where the trouble was, and give an idea as to the proper remedy.

784. Cylinder Clearance.—"If you had an engine all stripped, had the cylinder rebored, guides planed and a new set of boxes made, how would you know before setting it up what clearance there would be in the cylinder when it was set up again?"—*G. O. F.*

Answer.—If all parts were put up the same as they came down there should be no change in the cylinder clearance. If you wish to know positively, however, before the engine is set up, couple the main rod piston and crosshead together on the floor, then measure the distance from the front face of the piston to the center of the brass in the back end of the main rod; add to this one-half the length of the stroke; the difference between this measurement and the distance from the center of the main box to the inside face of the front cylinder head will be the clearance at the front end of the cylinder. To find the clearance at the back end of the cylinder, measure the distance from the inside face of the back cylinder head to the center of the main box, then take from the first measurement found, viz., length of main rod, crosshead piston, etc., one-half the length of the stroke and also the thickness of the piston head; the difference between this and the distance from the inside face of the back head to the main center would be the clearance on the back center.

785. Setting Valves on Duplex Pump.—"How are the valves set on a duplex pump?"—*G. O. F.*

Answer.—In setting the valves on a pump the steam chest covers are generally removed so that the movements of the valves can be observed. As is no doubt known, the piston on the right side moves the valve for the left piston, and the left piston actuates the valve controlling the admission and exhaust of steam for the right piston.

The valve rod is allowed a certain amount of play or lost motion in order that the steam ports can be held open until the piston has about completed its stroke. The length of the tripping arms, amount of lost motion, etc., is determined by the builder, and these dimensions should be maintained. In adjusting the position of the tripping arms, set one piston in the center of its stroke and set the other piston at the beginning of its stroke; the tripping arm on the side that is on the center should now be set exactly midway. We will call this, for convenience, the right side. With the right tripping arm vertical the short end of the arm to which the left valve rod is connected should also be vertical (either up or down). The left valve rod should now be so adjusted that the left valve will be exactly on the center of the valve seat, when the lost motion that the valve has is equally divided on the valve stem, button or valve yoke. The left side should now be adjusted in the same manner, and if the proportions are correct the pump will start off in any position, as, for instance, if the right side is in the center of its stroke and the left side at the beginning of the stroke, the right side will have opened the steam port for the left piston; as the right side travels ahead it continues to pull the left valve ahead, thus increasing the port opening of the left side. All this time, however, the left piston is also moving ahead, or in the same direction as the right piston. As the right piston reaches the end of its stroke the left piston will have opened the steam port ahead of it and started the right piston back. The left piston is now at the center of its stroke and must, of course, complete it, and to do this the steam port must be held wide open. Here is where the lost motion given to the valve on the valve stem comes in, as if there was no lost motion the right piston as it travels back would immediately begin to close the left side port; instead of doing this, however, it first overcomes the lost motion and does not begin to move the left valve until the left piston has nearly reached the end of its stroke, the right piston by this time being almost at the center of its stroke again. The left side, of course, is operating the right-hand valve in the same manner. By moving the pistons forward and back by hand and watching the valve movements you should have no difficulty in adjusting the valves so the pump will start right off in any position.

786. Cylinder Cushion in Pumps.—"What keeps the pistons from striking the ends of the cylinders in a pump?"—*G. O. F.*

Answer.—As a water pump is always working against pressure, the piston will stop as soon as the force behind it (steam) is cut off, and as the steam is cut off and the action of the pump reversed at the completion of the stroke the piston can not strike the head, as both the pressure of the water and the steam cushion will prevent it.

787. Cushioning Pumps.—"How do you set the cushion in a pump so that you will know when you start her up that she will run all right?"—*G. O. F.*

Answer.—This question is answered in answer to previous question, "Setting Valves on Duplex Pump."

788. Saving Waste Heat.—"If you took charge of a plant where they were heating a building with steam at 5 pounds pressure and the returns were wasted, and the owner wanted the returns saved, what would you recommend doing, if the boiler set too high to return by gravity?" —*G. O. F.*

Answer.—We would recommend piping the returns to a hot well and using this as feed water for the boilers. Of course, it would be necessary to use a pump for feeding the boiler.

789. Construction of a B. & W. Boiler.—"How is a B. & W. boiler constructed?" —*G. O. F.*

Answer.—We presume by B. & W. a Babcock and Wilcox boiler is meant. These boilers, like all water tube boilers, are constructed of a series of water tubes expanded into headers in such a manner as to admit of free circulation of the water. These headers also connect with a steam drum placed over them, in which the steam generated in the tubes is stored. The boilers are set in a brick furnace in such a way that all heat generated by the fuel during combustion must pass upward between the tubes on its way to the stack or chimney, bridge walls being used to deflect the heat currents and aid combustion. A full description of the construction of these boilers would be too long for these columns; suffice it to say they are an externally fired water tube boiler, built on practically similar lines as all other high class water tube boilers.

790. To Prevent Rusting of Boiler.—"If you were to shut down a Stirling boiler for the winter, what would you do to prevent wasting or rusting of the boiler?"— *G. O. F.*

Answer.—The boiler should be thoroughly cleaned, being brushed with a stiff wire brush, especially the insides of the tubes. If it is then given a coat of graphite and oil, or, better yet, a light coat of Dixon's graphite paint, there will be no danger on account of rust or oxidization.

791. Setting a Pop Safety Valve.—"Suppose that you had a pop safety valve that blew at 100 pounds pressure, and you want to reduce to 70 pounds, how would you change it? Also one from 20 pounds to 10 pounds?"—*G. O. F.*

Answer.—Slack off on the nuts or set screws, as the case may be, that compress the pop springs; in other words, reduce the tension on this spring. The same methods to be used regardless of pressure carried. The amount the tension must be reduced can only be found by trial.

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792. Pop Valve Held Open Too Long.—"If you had a safety valve that opened at 80 pounds and did not close tight until about 70 pounds what would cause it, and what would be the remedy?"—*G. O. F.*

Answer.—This depends altogether on the design of the pop valve. Some types have an adjusting ring which can be turned to the right or left as necessary, to cause the pop to seat after the pressure has been reduced to any amount desired. That is, the pop can be set so it will close on a one-pound reduction of pressure or can be held open until the pressure has fallen five or ten pounds. With an ordinary pop not fitted with an adjusting ring the trouble may be due to guide pin catching or hanging in the spring, to a slight shoulder on the wings of the valve, to the seat being too wide, or, in case of a grooved seat, to the groove being too deep, or the lip on the outside of the valve being too long. There are many different types of pop valves and equally as many reasons why they will not seat promptly. The same general law holds good in all cases, however, viz., the less the area of the outer edge of the valve against which the steam must act in escaping, the more promptly will it seat.

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The Westinghouse Air Brake.

Answers by F. B. Farmer.

448. Undesired Quick Action.—"Your opinion of the appended is earnestly requested. A 50-car train and leakage slight. New York Air Brake Co.'s B-2 Locomotive Equipment. Pressure controller for train pipe set at 70 pounds and for main reservoir 90 pounds. With this valve full release is also straight-air application position.

"With handle of engineer's valve moved from running to full release position, train being fully charged, the train brakes would apply emergency and occasionally heavy service. At end of trip I took out controller valve piston, spindle and valve guide; cleaned, oiled and replaced them, but did nothing to the regulating portion of the controller, as with train pipe pressure at 40 to 50 pounds there was no blow at vent port *C*, showing diaphragm *PG13* and seat *PG14* to be tight. Had same engine on return trip and could not get automatic action in straight-air application position (full release), try as we would.

"I claim pressure controller valve *PG95* stuck in valve guide. Engineer claims faulty piping. My argument is that in this position train pipe and main reservoir cavities in brake valve are in direct communication, and that if straight-air goes from main reservoir cavity faster than it feeds through pressure controller, air will come from train pipe cavity to main reservoir cavity and thence to the brake cylinders, thus applying the brakes. Am I right?"—*A. C. P.*

Answer.—The description given indicates clearly that you are right in assuming that for some reason the supply portion of the pressure controller failed to open promptly when the handle of the brake valve was moved to release position to apply straight-air. Hence, the driver brake cylinders drew on the brake pipe air and applied the train brakes.

While cleaning the supply portion of the pressure controller remedied the trouble, thus indicating that its operating ports had been sticking, a similar action may follow if the regulating portion varies in its action, as from gum accumulating at the diaphragm seat and from vent port *C* being choked shut.

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449. No. 4 ET Equipment Problem.—"Engine has No. 4 ET equipment. With the handle of the automatic brake valve in running position and the gauge showing 70 pounds and 105 pounds, on applying the independent brake the red hand drops back about 5 pounds, and the black hand goes up 15 pounds. On releasing the independent brake and again applying it the black hand again goes up until, in heavy switching service, the hands stand equalized all the time.

"If standing for some time with the independent brake applied the black hand will drop back to 70 pounds. What is the reason for the foregoing?"—*H. L. W.*

Answer.—With the No. 4 ET equipment the distributing valve supply pipe was connected in two different ways. With the earlier sets it was connected directly to the pipe leading from the main reservoir to the automatic brake valve. As in double-heading this arrangement occasionally made it necessary for the engineer of the second engine to make an independent release of his brakes, due to reapplication after release by the head engineer, later engines were piped as follows, and which is evidently the arrangement on the engine in question.

The supply to the distributing valve was taken from the feed valve pipe, the one between the feed valve and the automatic brake valve. Therefore, if the feed valve were set at 70 pounds, then no more than this could reach the distributing valve. However, without additional provision the use of the independent brake valve in application position would also have caused an automatic application, making altogether a heavier one than usually desired, the reason being that the application valve of the distributing valve would, on going to application position, suddenly open the feed valve pipe to the brake cylinders. Before the feed valve could open this would have caused a drop in feed-valve pipe pressure and in brake-pipe pressure also. as running position of the automatic brake valve would then be connecting these two pipes.

To prevent such an action as just described a check valve was placed in the feed valve pipe between its connection with the automatic brake valve and where the supply pipe to the distributing valve branched off. This would let air flow to the brake pipe but would not let it return.

In the case described the feed valve was a little slow in closing. It opened when the independent application was made, as indicated by the brake applying and by the drop in main reservoir pressure. But when the distributing valve suddenly stopped drawing from the feed valve pipe, the pressure in the latter rose so rapidly as to run above 70 pounds before the feed valve could get shut, it then having nothing but pipe to fill. Any such overcharge was driven past the check valve and into the brake pipe and thus showed on the black hand of the gauge. With successive applications this gradually raised the brake pipe to the main reservoir pressure or very close to it.

Where the independent brake was allowed to stand applied for a time, there was enough brake-pipe leakage to gradually reduce the brake-pipe pressure to 70 pounds, where the feed valve would again supply it. It would also have reduced to 70 pounds with the engine brakes off.

With a longer brake pipe, as with a train, this would not have occurred. Neither would it have been as probable with locomotive brake cylinder leakage. However, the remedy, until such time as this ET equipment is changed, is to clean the feed valve, making sure that its piston is put up dry, with it and its cylinder free from gum, and that there is no leakage from either of the feed valve cap nuts, as such leakage, or oil or, which is worse, grease about the piston will cause the piston to be slow in closing the supply valve after the regulating valve has shut. If poor piping of the main reservoir or an excessive amount of oil used in the pump air cylinder causes the feed valve to get a heavy supply it will augment such a trouble as this.

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450. Lessening Inequality in Braking Power.—"I understand that with a long freight train having loads ahead and empties at the rear there is inequality in the braking power throughout the train. I have heard that this inequality of braking power could be lessened, to a certain extent, by heavy initial service reductions.

"If this is correct please explain why or how the heavy reduction lessens the inequality of braking power. I have assumed that an additional and heavy reduction would tend to cause the train to part."—*N. K.*

Answer.—Answering your questions in the order stated, a train made up with empties in one half and loads in the other does produce unequal retardation or braking effect. That is, the part with the empties tries to stop first. If ahead the tendency is to bunch the train; if at the rear to stretch it. As loads and empties cannot be distributed through trains owing to increased switching it would cause, the safer plan is to have the empties at the rear, as is usual.

Under such a make-up a break-in-two will result in the two portions being pretty well separated when they stop, because the brakes on the empty cars can stop that portion of the train quicker than can those on the loads.

This *distance between the two parts of the train*, after stopping, *has done no damage, but it indicates how the loads would have tried to drive through the empties* after a break-in-two with the empties ahead.

Stated differently, with the empties ahead there would be less *tendency* for the train to break-in-two, but if it did, as when at low speed just after starting, the results would be much more serious than if the empties were at the rear.

Regarding the possibility of lessening

the inequality of braking power, the result of empties behind loads, by a heavy initial service reduction, it cannot be done. As a matter of fact, but not necessarily as a guide for practice, the heavier initial reduction will, with very long trains, cause the greater inequality.

To illustrate this we will let two similar cars, one an empty weighing 30,000 pounds and the other a load weighing 90,000 pounds, each car braked at 70 per cent. of its empty weight (empty weight 30,000 pounds) represent the two halves of the train. With 10 pounds in the brake cylinder of each they will put the same pressure on their brake shoes, but this will mean 3.88 per cent. of the weight of the load and 11.66 per cent. of the weight of the empty, or three times as much for the latter. With 50 pounds in each brake cylinder the load will be braking at 19.44 per cent. of its weight and the empty at 58.33 per cent. of its weight, again three times as much.

The foregoing does not imply that a reasonably heavy initial reduction will not lessen break-in-twos, as compared with other methods that may comprehend a light initial reduction. To thoroughly analyze all of the factors that contribute to break-in-twos is a long, a complicated and a confusing matter. For the road man the most important thing to remember on this subject is that break-in-twos are almost entirely due to slack running out too suddenly; also, that *to control the slack action of trains is to pretty well control break-in-twos.*

Where empties at the rear run out the slack so suddenly as to break the train in two there are two different strains or forces exerted at the time of separation; first is the one due to the brakes on the empties having less to stop than do those on the loads, and thereby, even if the train were stretched solid and no damage done, *would be trying to separate it by a steady pull,* in the same way as when great care is exercised in starting a heavy train with a powerful locomotive. The other force is by far the more serious one. *It is the result of the rear end of the train slowing down faster than the head end while the slack is running out, and the shock that occurs when, all of the slack being exhausted, either the two halves of the train must instantly come to the same speed or a break-in-two must occur.*

To say that a certain pressure is applied to the brake shoes of a car can convey no definite idea of how much holding power or retardation will result, because it leaves out the speed factor. With a fairly high brake shoe pressure (heavy initial reduction) when speed is at 30 or 35 m. p. h. the shoe friction or holding power will be relatively so low as to permit the train slack to become adjusted gradually, to run out in the case of empties at the rear, after it had run in to a greater or less extent during the early part of the reduction. With no farther reductions *the slack would stay out* to the stop.

Very different results would likely follow if the same heavy reduction were made at 12 to 15 m. p. h. and were followed by the service exhaust closing when the speed had reduced to about 4 or 5 m. p. h., as then *the slack would likely be running out at low speed when shoe friction is high.* This means that the brakes hold better and that any slack will permit the empties to slow down much more rapidly than the loads, thus creating the dangerous difference in speed, as before mentioned.

Some follow the practice of making an additional reduction just as the stop is being completed, the object being to have the head brakes increasing in holding power more rapidly than the rear ones so as to reduce the strain on the couplers where empties or lighter loads are at the rear. If done just right it will undoubtedly help, but if not it will make matters much worse.

The danger from the comparatively light initial reduction is not that it will cause any shocks or strains, such a suggestion being groundless, but lays in the additional reduction or reductions that are so likely to follow and at low speeds. We will assume the long train with empties behind loads. After the light initial reduction the brakes on the empties will very gradually stretch the train. The car coupler springs will be resisting this stretching process and *trying to puli the slack in.* As the speed decreases the brakes will hold better and this stretching will increase. Then, when the speed is 8 or 10 m. p. h., if a farther service reduction is commenced it will first be felt by the head brakes, which will start the slack running in or, at least, relieve the tension on the coupler springs in the front portion of the train. Up to this time the loads had been pulling on the empties. Consequently, as soon as this pull eases up the empties will reduce in speed more rapidly. To make matters worse, the reduction will be felt at the rear just about this time. With some slack not yet out and the speed now very slow the rear portion of the train will stop rapidly, almost instantly. As the loads cannot stop as quickly the slack will be suddenly exhausted and draft gear will have to fail.

Not so many years ago many roads had, at places, a succession of "hog backs" or knolls close together. Some have them yet. With short trains of medium capacity cars these merely caused moderate jerks and bumps, but with the advent of more powerful locomotives, larger capacity cars and longer trains, particularly the latter, these places at once established records for break-in-twos. The engineer whose record suffered least from them was the one who could best control the slack, keeping it in or out or, where a change could not be prevented, forcing it to take place gradually. Success with long air-braked trains requires, in addition to the knowledge and care just mentioned, an equal amount on how the brake action affects the slack and how to best control it.

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451. Air Pump "Dances."—"What causes a 9½-inch pump to "jiggle" when it is first started and, again, when the governor is shutting off the steam?"—*L. H.*

Answer.—It is because there is not enough steam being admitted to hold the reversing valve to its seat in its upper position and is made worse where a pump steam cylinder is excessively lubricated, very rare on a locomotive. These short strokes occur with the pistons at the top of their cylinders. As the reversing valve is raised the main valve is reversed and the main piston starts down quickly. This quick start is due to the weight of the parts, to any compressed air in the clearance space above the air piston and because there is now only atmospheric pressure below this piston. As the steam supply to the pump is restricted, as stated in the question, the sudden filling of the space above the descending steam piston weakens the pressure back of the reversing valve, the weight of it and its rod causes it to drop and the pump promptly reverses. This operation is rapidly repeated. Where a pump is being started the "dancing" can be stopped by opening the pump throttle a little more.

A cause outside of the foregoing, but one that aids those described, is a reversing valve rod bent so that it binds. An examination will disclose this as the side of the rod will show wear, often on the button.

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452. Eight-Inch Pump Stops.—"With an 8-inch pump in apparently good condition when the engine was left on the cinder pit and the pump shut off, what defect would prevent that pump from starting when steam was turned on again and why?"—*L. H.*

Answer.—It being stated that these are examination questions, the writer suggests that this one is of little value and hardly fair to the student. Years ago, when repairmen knew less about air pumps, a *very* rare failure that could occur at any time after the pump was shut off by the governor or the throttle, was the steam valve dropping down until a lower packing ring in one of its two pistons got below and caught on its bush, thus preventing the pump from starting when steam was again admitted. This could occur only where the valve stop was of the earlier type and had been broken off or after a short one had been put in.

This valve stop was at one time a wrought-iron pin located in the center piece just below the main valve, but many years ago the design was changed to a cast stop that could not break. But even the earlier one will never break if parts are standard. If they are not, then the repairman needs instruction and examination more than the enginemen do.

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453. Pump Air Valve Lift.—"How is the lift of the air valves in a pump regulated and how much lift should they be allowed to attain before being changed?"—*L. H.*

Answer.—For the 8-inch pump the lift of the receiving valves should be ⅛-inch and of the discharge valves 3-32-inch. For the 9-inch pump the lift is 3-32-inch for each valve, receiving and discharge. After the valve seats are trued up and the valves are ground in, the lift is regulated by filing sufficient from the boss left on the top of each valve for that use.

How much the lift should be permitted to increase before it is again repaired depends considerably on how hard service the pump is in, but in any case an increase of 1-16-inch should justify repairs.

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454. Pump Throws Water Out of Stack.—"Why is it that whenever the governor on a certain engine shuts off the pump, when the engine is not working steam, that when the governor allows the pump to restart, water is sprayed over the boiler and front windows? How remedy?"—*L. H.*

Answer.—Air pump is not supplied with dry steam. Provide an adequate dry pipe.

455. Rotary Valve Lubricant.—"What is the best lubricant to use on a rotary valve?" —*L. H.*

Answer.—The "best" is a matter of personal preference. There are many good ones, such as valve oil, tallow, vaseline and some of the special brake cylinder lubricants and, as well, the triple valve lubricants.

456. Kerosene in Air Pump.—"A certain engineer on this division uses about a teaspoonful of kerosene oil in the air end of his pump once a week and in the following manner: He puts the kerosene in the pump when it is cold and, after the pump has made a few strokes, he gives it about the same amount of valve oil. Why is this not considered good practice?"—*L. H.*

Answer.—For two reasons: First, because the heat of compression is often sufficient to generate and explode a gas from kerosene. The precaution taken by this engineer may prevent any explosion, but all would not be as careful and there should be no special privileges. Furthermore, the gas from the kerosene carries gummy deposits from the pump to the other brake parts on the engine, which prevents their correct operation and requires more frequent cleaning.

457. Brake Valve Discharges Water.—"What causes water to squirt out of the brake valve when the emergency application is used?"—*L. H.*

Answer.—Insufficient cooling of the air before it passes from the main reservoir to the brake valve, the outlet to the latter too low in the reservoir or failure to drain the main reservoir as often as needed.

Compressing air heats it and concentrates the moisture. As it cools the air will drop this surplus of moisture. The pump discharge pipe and the pipe between the main reservoirs, where there are two or more, should be long enough and, the reservoirs, too, should be in a sufficiently cool location to get the air nearly or fully as cool before it starts to the brake valve as it will be when in the brake pipe. If so, there will be little or no moisture in the tender brake pipe to blow out of the brake valve when emergency position is used. But if the air has not cooled before it passes through the brake valve it will drop the moisture in the tender brake pipe.

458. Driver Brake Releases After Emergency Application.—"Why is it that the driver brake usually releases when I spot the engine with an emergency application?" —*L. H.*

Answer.—You make a quick move to emergency position and back to lap. This reduces the brake pipe pressure, but not that in the equalizing reservoir, as the black hand will show if observed quickly. The equalizing reservoir pressure then leaks past the equalizing into the brake pipe and raises its pressure above that left in the driver brake auxiliary reservoir, thus causing its triple valve to release the brake.

Other causes that contribute are long piston travel and cylinder leakage with the driver brake, either or both; short-piston travel and a tight cylinder on the tender, and a tender triple valve so defective as to allow its auxiliary reservoir pressure to leak back into the brake pipe when the pressure in the latter is the lower of the two. The fault with such a triple is a leaky packing ring and cylinder cap gasket. In fact, the other conditions than the brake valve can alone cause the action described.

459. New York Accelerator Valve.—"Why is it that the accelerator valve with the New York B-2 equipment does not work with a light engine, but will work when coupled to nine passenger cars?"—*L. H.*

Answer.—It is designed to so operate, the idea being that a short brake pipe will reduce rapidly enough without assistance from the accelerator valve. Their instruction pamphlet states:

"The valve operates when there are eight or more cars in a train and requires from fifteen to seventeen pounds pressure in the divided reservoir to operate it. Any pressure passing into this reservoir, as with a shorter train than eight cars, will be discharged to the atmosphere through ports *S* and *T*, the slide valve remaining closed."

The service discharge from the brake valve must pass through the accelerator valve to reach the atmosphere. If it does not exceed what ports *S* and *T* can care for the accelerator does not work. The nine passenger cars increase the brake pipe volume to be discharged beyond the capacity of these ports, which causes the accelerator to operate and assist in discharging the brake pipe air.

460. Advantage Claimed for Accelerator Valve.—"What advantage is claimed for the New York accelerator valve over the older form of their brake valve?"—*L. H.*

Answer.—That with long trains, particularly freight, it will be more certain to apply all brakes and that the stopping distance, in a service application, will be shortened.

461. Reduction to Fully Apply from 60 Pounds.—"How much is it necessary to reduce train pipe pressure from 60 pounds to fully apply a brake?"—*L. H.*

Answer.—Assuming piston travel is eight inches it will require a reduction of 18 pounds, as 60 pounds in the auxiliary reservoir will equalize in the brake cylinder at 42 pounds.

462. Heating of Air by Compression.—"Is there a rule or formula with which you are familiar that gives the heat due to compression of air as the compression increases?"—*N. K.*

Answer.—The following table is part of one published many years ago by the Ingersoll-Sargeant Drill Co. in a catalog and doubtless gives the information you desire:

TABLE

Showing Heat Produced by Compression of Air, the Volume at Atmospheric Pressure being 1, at the Temperature of 60° Farenheit.

PRESSURE.		Theoretical Increase of Temperature without Cooling in Cylinder.
Atmospheres.	Pounds per Square Inch above the Atmosphere (Gauge Pressure).	
1.00	0.00	from 60.0° Fahr.
1.10	1.47	74.6
1.25	3.67	94.8
1.50	7.35	124.9
1.75	11.11	151.6
2.00	14.70	175.8
2.50	22.00	218.3
3.00	29.40	255.1
3.50	36.70	287.8
4.00	44.10	317.4
5.00	58.80	369.4
6.00	73.50	414.5
7.00	88.20	454.5
8.00	102.90	490.6
9.00	117.60	523.7
10.00	132.30	554.0
15.00	205.80	681.0
20.00	279.30	781.0
25.00	352.80	864.0

ET Equipment Tests—Errata.—A reader of the Magazine has very kindly called the writer's attention to an error in the answer to Question 438, ET Equipment Tests, in the March number, as follows:

Near the bottom of second column, page 374, the double-heading pipe of the distributing valve is designated as "the lower of the three pipes on the left side, facing the valve." Near the top of the first column on page 375 the application chamber pipe is located as the "next one above" the double-heading pipe. This should be reversed, the application chamber pipe being the lower, and the double-heading pipe the next one above it.

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Train Rules and Train Practice.

Answers by G. E. Collingwood.

328. Both Orders in Effect.—"Train No. 4 runs from J to A, and is a train of superior direction; train No. 3 is a train of the same class, and runs from A to J. Order No. 5 is issued reading as follows: 'No. 3 has right over No. 4 B to H'; subsequently order No. 7 is issued reading: 'No. 3 meet No. 4 at G.' When this condition arises should order No. 5 be annulled, or is it understood that order No. 7 is superseded by order No. 5."—*L. H.*

Answer.—It often occurs that several train orders are issued regarding one train, and all of them remain in force working together in harmony. This is true in the case under consideration; order No. 5 simply reverses the rights of No. 3 and No. 4, making No. 3 a train of superior right so far as No. 4 is concerned; order No. 7 makes a meeting point for these two trains at G, and in meeting at this point No. 4 must take the siding, as it is inferior to No. 3 between B and H. The fact that one train is superior to another by right does not prevent a meeting point being made between them. In such cases it is not necessary that the right of track order be annulled, because at any meeting point between two trains, one of them is always superior to the other. A train order or part of an order is not superseded unless the words "instead of" are used.

329. Rule 94 and Sections.—"Our trainmaster rules that the second section of an inferior train having orders to meet a superior opposing train can overtake the first section at an intermediate blind siding unable to make further for such superior train and take this first section ahead of it to the meeting point with a superior train, under the provision of Rule 94.

"I hold that as the first section is tied up for such superior train the superior train has right to proceed until it meets the first section, as it is superior to the first section."—*H. J.*

Answer.—Your trainmaster rules correctly. The second section of an inferior train holding a meet with an opposing superior train can take the first section ahead of it to a meeting point with a superior train, if it overtakes such first section between telegraph stations. Rule 94 uses the word "train," and a section is a "train," within the meaning of the rule. The Standard Code of train rules states that each section has equal time-table authority; this means that the following section is not restricted by any orders held by the leading section when it overtakes the leading section, under conditions where Rule 94 can apply. When a meeting point is made between a superior and an inferior train, the superior train cannot pass such meeting point even though it has time to make the next station in advance and clear the time of such inferior train, because an order once in effect must continue so, and while the train order is in effect it must be obeyed. We have always advised that when a section overtakes another section, under conditions when the second paragraph of Rule 94 would apply, that trainmen should be very careful in taking the leading section ahead of them, for the reason that complications are liable to arise. In the interest of safety, railroads would do well to state as a principle that when one section overtakes another section of the same schedule, the second paragraph of Rule 94 would not apply, or if such rule would seem to be too sweeping in its effect we suggest that railway companies issue instructions stating that, "when one section overtakes another, the second paragraph of Rule 94 will not apply, unless the following section holds right superior to any right which the leading section holds." We would much prefer, however, that the second paragraph of Rule 94 should not operate at all when one section overtakes another because of the great danger attending such movements. The danger between sections of the same schedule is due to the fact that the new paragraph to Rule 94 states plainly that a *train* unable to proceed against the *right* or *schedule* of an opposing train overtaken between telegraph stations by a train which has right or schedule which permits *it* to proceed may take the delayed train ahead of it to the next telegraph office. In the case of a second section overtaking the first under these conditions when the first holds an order to meet an extra the superiority granted the second section under the rules has in no way been restricted except by the presence of the first section ahead of it which it must not pass. But the rule could not possibly contemplate that the train which is overtaken should be a restriction to the following train, else this rule would be of no value at all in any case. As it reads it is intended to do away with any restriction that may be holding the leading train, and as the order which is holding the leading train reads "first" it certainly does not include the second section, else Rule 218 and several other rules in the code need revising. We do not say that a train crew would be foolish enough to force a section ahead of them under such circumstances, but we call attention to the wording of the rule so that trainmen and others interested may be on their guard. Rule 94 should be so revised that it can be obeyed without danger. As it now reads it can not be obeyed in every case without accident resulting when sections of the same schedule are concerned. In order that we may work the rule safely between sections now we must read into the rule something which it does not contain, to the affect that should a leading section be overtaken by another section of the same schedule, the second paragraph of Rule 94 will not be in effect if the leading section is restricted by "right," but if the leading section is only restricted by "schedule" the second paragraph of the rule will govern.

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330. How Could It Occur.—"Referring to question 287, on page 704, in the November Magazine, G. O. F. asks whose fault it would be if No. 9, after meeting first 14, and another train which they took for second 14 (but which in fact was No. 10) should pull out after No. 10 passed and go against second 14 without orders. It seems to me that No. 9 would be at fault in such a case, as I cannot see what right No. 9 would have to go against No. 10's schedule without orders.

"Can G. O. F. explain how he figures it out?"—*G. L. B.*

Answer.—The fact that No. 10 met No. 9 when they were waiting for second 14 to go indicates that No. 10 was overdue at that point, and also indicates that No. 10 was superior to No. 9. It therefore seems that should a case occur as mentioned, No. 9 would be at fault if they pulled out after meeting what they supposed to be second 14, for the reason that they would be running against the schedule of No. 10, at a time when No. 10 was overdue. Perhaps there is something in connection with this case that G. O. F. has not explained.

The above case brings to mind an accident which occurred a few years ago. The accident was caused by mistaking the identity of a train, and we recommended at the time that the last section of a train should carry a distinctive signal so that it would not be mistaken for another train. The accident of which we speak occurred as follows: No. 2 was due to leave its initial station at 1 a. m. and No. 4 was due to leave its initial station at 2 a. m. No. 1 was given orders to meet second No. 2 at C; they held no orders against first No. 2, as they were then on time. No. 1 made D (a blind siding) and got clear for first No. 2, expecting first No. 2 to be on time, in which case they would have ample time to make C for No. 4. After No. 1 had waited for some time a train passed displaying signals; this train was taken for first No. 2; shortly after this another train passed without signals and as No. 4 was then due it was taken for No. 4, and as No. 1 held orders to C for second No. 2 they proceeded and met first No. 2 between stations.

Investigation developed the fact that there were two sections of No. 4, and instead of No. 1 meeting first No. 2 and No. 4 at D as they supposed, they had met first and second No. 4. It seems that first No. 2 had become disabled at C and first and second No. 4 had passed them there. If we had a rule requiring the last section to carry a distinctive signal, an accident of this kind could not occur, but unless we have a rule of this kind or unless identification cards are exchanged an accident of this kind might develop on most any road.

331. A Fixed Signal.—"The conductor and myself cannot agree as to the exact meaning of the following rule: 'A fixed signal must be used at each train order office, which shall indicate *stop* when there is an operator on duty, except when changed to *proceed* to allow a train to pass after getting train orders, or for which there are no orders. A train must not pass the signal while *stop* is indicated. The signal must be returned to *stop* as soon as a train has passed. It must be fastened at *proceed* only when there is no operator on duty.'

"One of us contends that it is proper for the operator to hold the semaphore arm down and not fasten it when he has no orders for a train, and that a train cannot pass the signal when at stop even though it be in the yard limits. Please interpret the above rule."—*W. H.*

Answer.—The rule you quoted is a Standard Code rule and when working under this rule a train must not pass the train order signal when "stop" is indicated, if the train is on the main track, regardless of whether it is in a yard or at a small station where there is no yard. When "stop" is indicated it is proper for a train to pull by the signal when going in on the siding, but when they do so they must be governed by the indication which the signal gave when they passed it.

When a railroad company wishes its trains to pass a train order signal far enough so that the train can do work at a station, such as discharging passengers and freight, the rules must be modified to such an extent that they will permit of a train pulling by far enough to allow work to be done, at points where this can be done without the engine fouling the switch at which an inferior train moving in the opposite direction would enter. Some roads arrange their train-order signals so that they are far enough beyond the station that a passenger train will not be required to pass them to do station work.

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Railway Club Proceedings

*The Life of Side Sheets of Wide Fireboxes.**

The life of side sheets in fireboxes of modern locomotives presents a problem which demands attention on account of their short life as compared with the older types.

A prominent mechanical officer recently stated the matter about as follows: That the old style deep firebox with O. G. sides was rather hard on staybolts, but the boxes lasted on an average of from six to nine years. The later wide fireboxes, while easier on staybolts, frequently fail in two or three years. On this showing it was thought that the tendency in firebox design would be towards a modified O. G. side with very flowing lines.

The above statement presents an effect and a possible remedy without stating the causes which bring about the shorter life. It is unfortunate if we cannot utilize an increase in the width of the grates to secure the area necessary in large locomotives without such a loss of life of the side sheets. It has not been noted that the crown sheets are similarly affected. There has been no radical change in the quality of the steel employed, nor of the fuel or service demanded of the locomotive that would account for the trouble, and we are forced to the conclusion that there must be some element in the design or operation of wide fireboxes which has an unfavorable influence not clearly understood.

By the life of side sheets is meant serviceable condition, freedom from cracks, leakage, and other failures that may require renewal. The life is not particularly affected by the pressure carried, as the staying is generally done with a large factor of safety, but is directly affected by the temperature changes, the expansions, and contractions in service under steam and when out of service, laying on sidings, over cinder pits, in washing out, and water changing.

Steel will stand a certain number of stresses before failure, dependent on the degree or amplitude. We can increase the number of vibrations of a test specimen in a machine by decreasing the amplitude. In a firebox it is difficult to decrease the number of the vibrations, as these are set by the service of the engine, the number of times it is fired up and cooled off, and these conditions are not materially different for the two types of fireboxes under discussion.

It may be, therefore, that the vibrations or movements of the side sheets of wide fireboxes are of greater amplitude to account for the shorter life.

At first thought one would say that the O. G. box presents a series of curves that will adjust themselves to meet those movements in a way not possible in the straight and more rigid side of the wide box. This is true only in part, as the side is straight longitudinally in both designs and this is the most important direction. Apparently, therefore, the increased amplitude is due to higher internal temperature of the side sheets by reason of less perfect heat transmission to the water in the leg.

In the later designs of boilers we find a general tendency towards the use of wider mudrings and water legs than formerly. This has resulted in giving staybolts longer life, as their increased length gives less angular movement. It has, however, decreased the rate of the flow of the water upward as the volume of water in the leg is increased. This point will be considered later.

In getting away from the O. G. form of box and the narrow water leg, it was thought that the circulation of the water would be improved, as the O. G. presents a curve adverse to the direct vertical rise of the water as it is heated and displaced by the cooler water coming from the throat. The results prove this theory wrong, or at least we have only gained in life of staybolts.

The secret of the matter seems to be that, if the rate of flow and its wiping, scrubbing, impinging action can be directed against the side sheets it has the effect of wiping off the steam bubbles as they form, prevents their combining into a film or curtain of steam against the sheet, which is by no means as good a conductor of heat as is the solid water. This theory will account for increased internal temperature of vertical and inwardly inclined side sheets and can be inferentially proven.

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*Paper by C. A. Seley, M. E. C. R. I. & P. Ry.

It is well known that crown sheets outlast several sets of side sheets, and while this is due in part to the fact that there are not the same variations of temperature at the same time in different parts of the sheet, it is also true that its surface presents no chance for formation of a film of steam and it has practically solid water in contact.

This is also true of the Wooten type of furnace, the parts failing being generally a limited portion at the sides, which approach the vertical. It has also been noted that the door sheets of fireboxes which have moderately inclined back heads do not last as long as those that are vertical. The incline forces the wiping action of the circulation against the outer sheet.

It has been stated that in the early days of torpedo boat design a locomotive type of boiler was tried because of its great efficiency and amount of steam produced per foot of heating surface in locomotive service. On the boat, however, it was an utter failure. By way of experiment this boiler was put on a vibrating cradle, which greatly increased the steam production. This could only be accounted for by an increased circulation, facilitating the heat transmission. It has been proven by late government experiments that increased boiler efficiency can be obtained by increasing the rate of flow of the gases, this action tending to wipe off from heating surface partially cooled gases, replacing with hotter.

Thus the questions of circulation, whether of water or gases, seems to be a very important factor in boiler efficiency, and while some of the examples quoted may be somewhat remote in their application, yet they seem to point to the circulation in the water leg as being a vital factor in the life of side sheets.

There seems to be no question that if there is a strong impinging circulation against the fire sheet, that the heat will be more freely transmitted, steam film prevented, solid water maintained against the sheet, and the internal temperature of the sheet kept down and the amplitude of the sheet movement reduced to the minimum.

To effect this the side sheets should not be vertical nor sloped inward, but be sloped or curved outward from above the fire line, but it is obvious that this cannot be extreme without getting into grate area difficulty.

It is quite possible, however, that we have gone too far and are too liberal in that respect, as the reports of successful steaming of some recent engines would seem to indicate, these engines having a much lower proportion of grate area than is common.

If this reduction can be made, it will permit the modification of side sheets as proposed. The question might also be raised as to the width of water leg. Aside from affording sufficient room to hold the accumulated sediment to a safe height, there seems to be no good reason for a wide leg except from the staybolt point of view. There is no question of a stronger circulation with the narrow leg, and if need be, some form of flexible staybolt could be considered for extreme cases of angular movement.

In the older designs of fireboxes it was often 80 inches from mud ring to the water level above the crown sheet, this water varying in temperature, while in circulation from 150 or 180 degrees at the bottom to the temperature due to the steam pressure at the top. The depth of this column of water in wide firebox designs is sometimes materially decreased, and as the temperature limits are about the same, it is apparent that for an equal width of water space the rate of flow of the circulation as a whole would be decreased about proportionately to the travel.

If in addition to this the width of water leg be increased, the rate of movement is further decreased.

If rapid circulation and a wiping effect will serve to carry off the steam bubbles, preventing steam film and overheating of fire sheets, this function has been absolutely sacrificed in most wide firebox designs and the short lived side sheets seem to prove it. The highest duty boilers are those having the most rapid circulation. The water spaces in legs and between tubes of fire engine boilers are very small, but the probabilities are that the rate of steaming and efficiency would be decreased if these spaces were materially increased and the larger volume of water would lower the rate of circulation.

It is quite likely that the rate of movement in the locomotive water leg has much to do with this question. The water next the fire sheet has an upward tendency. That next the outside sheet can only rise when heated by conduction through all the water particles the entire width of the leg or by the mingling, mixing actions set up by curving the sheets from the vertical. There seems to be a reasonable ground for the belief that there is a very sluggish circulation in a directly vertical water leg of considerable width, contributing to formation of a steam film and overheating of the sheets when fires are forced.

This discussion would not be complete without considering the other end of the temperature scale to which the fire sheets are subjected. As before stated it is the amplitude of the vibrations or movement of the sheet which are most subject to control. All possible mileage should be made between knocking out of fires. Firing methods can often be improved so that an engine can be turned without knocking the fire. The usual ash pit methods use up much of the life of side sheets, and cold water washing and filling, and hurry up firing up takes a lot more. It is quite true that the old time fireboxes had to stand all this, but while considering temperatures and their effects it would be just as well to help on the lower end of the scale if possible.

Improved methods of blowing down and filling up of the boiler at terminals, hot water, water changing and washout plants are now well demonstrated and these will all help to reduce the amplitude of the temperature scale traversed in locomotive operation as regards the firebox sheets and add to their life.

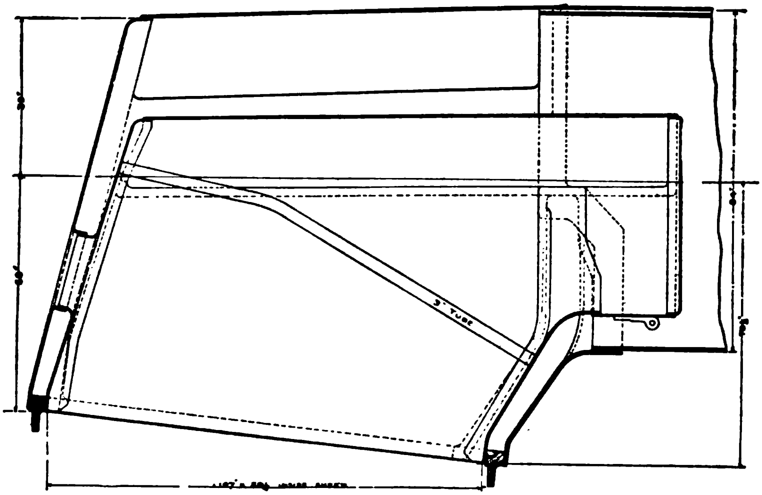
THE CHAIRMAN: Gentlemen, this paper is now before you for discussion. Mr. De Voy, may we call on you to open the discussion?

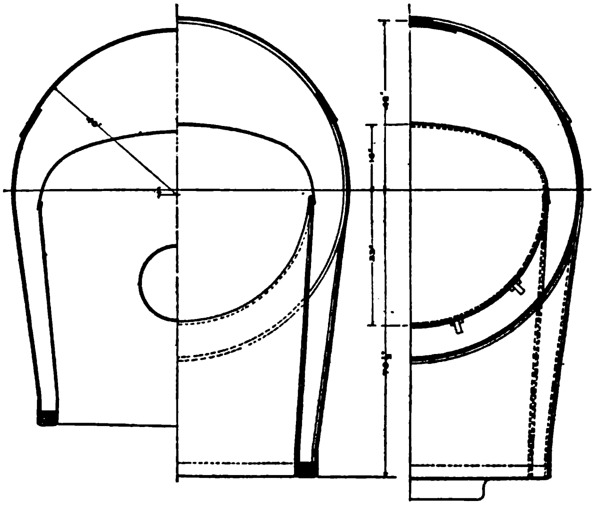
MR. J. F. DE VOY (C., M. & St. P. Ry.): I did not have the least idea of what my friend Seley was going to talk about at this meeting. I have listened very intently and jotted down a few notes, and inasmuch as we have done something in that line, I believe you will at least accord me the liberty of telling you what has been done, and in order to do that, I want to show you a blue print of a firebox that we use, to demonstrate a few of the ideas.

If you will pardon me, I will start with a few notes I made on something in which Mr. Seley did not agree with my friend Lawford H. Fry, in what he said five years ago regarding fireboxes, which we at that time thought would be dead long before the bad points could be found out, so do not think because I am going to differ from Mr. Seley on this that I therefore like Mr. Lawford H. Fry's idea, because I do not. I believe what Mr. Fry said before the Master Mechanics' Association, that the water following the inside of the firebox did assist materially in saving the firebox is absolutely true. The old O. G. firebox would take just that sort of a shape (indicating on blue print); it would curve. The modern wide firebox will be in the shape of the pen. The wide firebox as designed today—it is an abortion, and I do not care who says any different—the wide firebox is an abortion—does not allow the water passing from the injector and flowing down from the side, then again taking that upward tendency as it boils away from the inside sheet and presses toward the outside sheet, allowing the water to flow down the side, so that there is no question but what Mr. Fry's idea was right at that time. I want to read now.

In June, 1906, before the International Boilermakers' Association, I made a statement that I thought a moderately wide firebox—that is, what I call a moderately wide firebox, sixty inches in a seventy-two inch diameter—with flat firebox side sheets and wide water legs to admit of free circulation was what we were coming to. My reason for this was to endeavor to construct a boiler in which the cost of maintenance would be cut to a minimum, for in watching results obtained between the wide and narrow fireboxes in use on the Chicago, Milwaukee and St. Paul road I found that the narrow firebox engine was by far the most economical as far as the boiler repairs were concerned. In fact, I say that there is not any question but that the old narrow firebox was the most economical to maintain. Now, how can I prove that? It is not a theory.

We have eighteen Atlantic type locomotives with narrow box, 42 inches wide, to be exact, about ten years old—four of them have had a new door, flue, crown or side sheet in ten years. In twenty-eight Atlantic type locomotives, with wide firebox—in this particular boiler it was 62 inches wide, and the firebox was 66½ inches wide. I maintain that the diameter of the boiler here at the third sheet or dome sheet must be wide enough to admit of the slanting inward of the sheet in order to keep that covered, as the water boils upward all the time. In the twenty-eight Atlantic type locomotives which I speak of here, that was not so; it was so wide at that point that it did not permit that, and I contended then, and I do contend now, that it was the water not being kept against the sheet that cracked the side sheets. So of the twenty-eight Atlantic type locomotives with wide firebox about seven years old, each one of them had a new door, flue, crown or side sheet; some had as many as three sets of new firebox side sheets in that time, seven years, and there were only four altogether of the narrow fireboxes. In a year's time 140 staybolts were applied to the narrow box Atlantic type and 585 to the wide. Now, the firebox shown here is what I call medium wide. Don't get them mixed, because my ideas on fireboxes have been mixed a great many times by people who either did not understand what I was talking about or did not want to.





I found that leaky flues and staybolts were reported once in the narrow firebox to ten times in the wide firebox. A set of flues lasted about twice as long in the narrow firebox as in the wide.

With such a favorable showing for the narrow firebox over the wide, I decided —there is a gentleman in the room over me who helped to decide that, the superintendent of motive power of the Milwaukee road—I decided that a boiler could be gotten out with a moderately wide firebox, which would do the work of the wide firebox and would be much more economical in maintenance. Now, did we have the nerve to do it?

A boiler embodying the ideas as illustrated here is now being used in 170 Prairie type locomotives and five Atlantic type locomotives on the Milwaukee road, and there are 40 to be constructed at our shops and 37 at outside builders, so that illustrates whether we have nerve enough to put into use our ideas.

Fifty of the Paririe type engines have been in service thirteen months, but no sheets, arches or flues have been renewed and not a staybolt has been broken. The engines prove to be excellent steamers and are economical on fuel. That is a very strong statement to make, but I realize that the staybolts and the flues in any boiler ought not to begin to show any unsatisfactory results until at least nine months or a year after they are put in service, but it is the best information we have of what we believe to be correct.

The firebox is 60 inches wide—in other words, we have widened out here and narrowed up six inches there (indicating on blue print). So that the grate area is not so much as that in that very bad acting and shallow firebox. Before I get through I want to tell Prof. Breckenridge a little bit about that long, deep firebox, because I think he will be interested. The firebox is 60 inches inside the mud ring, with 4-inch water space. In regard to that 4-inch water space, I will say that I would have gone a little bit wider if I had dared to; I did not have the nerve to. I had a letter from Mr. Ben Johnston, superintendent motive power of the Mexican Central Railway, in which he sent me a drawing of a water space 8 inches in width, but I did not dare to go that far for a starter, although I believe he was right. Four inches water space at the mudring, widening out to seven inches at the top. You see that width there, widened out at the top to seven inches—the side sheets are as free from curves as possible. My reason for having them as free from curves as possible is that there is an extension on the inside of the firebox which cannot be properly taken care of in that type of boiler. With an O. G. shape—I am not saying anything about the O. G. shape, but I do say that that distance permits that expansion to a greater extent than it would be if it were an O. G. straight here and turned out. The reason that the O. G. did break so many staybolts is that it was expanded up to about that point, then up at the top corners it took a shear about and broke all the staybolts that were on both corners. That is the reason of it.

The side sheets are as free from curves as possible and slope outward as they rise from the mudring. This feature greatly helps the natural circulation—the same as Lawford Fry said it did—and the currents of steam and water impede each other very little. That is, the currents of water boiling away from the inside sheet, impede very little the downward circulation of the water coming in, and that you must have. The steam rising along the firebox sheets and the water descending along the outside sheets without mutual interference. I do not know that that "mutual interference" is just exactly the mechanical term, but it expresses my idea of it.

In a box with side sheets sloping inward, as they rise from the mudring, the steam tends to rise from the side sheets through the water legs and along the outer sheets to the steam space, which interferes with the descending water.

The increased width of water space over our other engines also increases the flexibility of the staybolts. I would have gone out to the 8 inches if I had to; maybe I will some day if I get the chance—and the engines have proved this to be true.

These boilers are fitted with combustion chambers.

Now, I will tell you the reason why they are fitted with combustion chambers. This will not be new to you, because I stole this from the head of the mechanical department of the University of Illinois, so I do not claim any originality in this line, although it is absolutely true. I quarreled with one of the locomotive companies, in connection with my superior officer, all one afternoon for an additional inch in depth of throat, for one inch more than what they wanted to give us. In other words, I believe up to three years ago we had a depth of area greater than anybody in the United States; at least, that I knew of, for the reason that about the point that I show you as the top—the greatest fire is about to that height (indicating) when the coal is to be burned. Now, in Illinois coal it is not a hard matter to burn the carbon contents—I never have thought it was, anyway—but the volatile matter, or length of smoke, as Prof. Breckenridge put it, does require some space to turn and it gets it as it passes back of the brick arch and forward to the combustion chamber, and it does mix the internal gases better, and the mixing of the internal gases in the firebox of a locomotive boiler, and the proper mixing or fluctuations of the water on the inside are absolutely responsible for all firebox failures, and I realize very well what I am saying and what objection there will be to it by boiler washers.

Boiler washing has not got all to do with it. I have said many a time that a man could design a boiler that would do away with this, and we have done away with a whole lot of it, and that is by a recent device to have the length of flame or length of space in which the volatile matter is burned, or mixed, or whatever you term it. That all shows there (indicating).

Just a few remarks about the taper, about the difference in the sloping of the sheets. You might ask, why does it not slope the same way, that is away from it? The water does not circulate at the back head of a boiler anywhere nearly as much as it circulates there (indicating). In fact, I doubt whether it circulates at all back there. And another thing, I would say that a man was almost out of his head if he carried that much away on a locomotive boiler. That is absolutely unnecessary, that is all taken off. There is not much of any heating surface taken away, so that while that is a little bit at variance with the other theory, still you cannot do away with it at all.

I most thoroughly agree, gentlemen, with the speaker in all the other ideas that he has advanced, only those perhaps were not quite in line with what I took issue with him on; I did not so much wish to take issue with him as much as to demonstrate our ideas as to a boiler, and I thank you very much for listening to me.

THE CHAIRMAN: It seems as though it would hardly be necessary to call on any one to continue this discussion.

MR. W. C. SQUIRE (Cons. Eng.): I would like to ask Mr. Seley a question. In his paper he stated that there was always solid water on the crown sheet and further stated for that reason they had very few failures or no failures of same. He then stated the side sheets would have to be sloped outwardly from the mudring in order not to have the steam and water currents interfere with each other. If it is true that a crown sheet always has solid water on it, then with a side sheet which was inclined inwardly from the mudring and approaching the same plane as that of the crown sheet, one would naturally expect to get identically the same results from such construction because the upgoing or rising bubbles of steam must pass through the water that surrounds them above the side sheets as much as they do on the crown sheet. The confines of the water leg would have no bearing on the general proposition on this basis.

MR. M. H. WICKHORST (C., B. & Q. Ry.): Mr. Seley has taken a little bit unfair advantage of those of us who would like to discuss his paper by not having it printed before hand.

I am inclined to agree with both Mr. Seley and Mr. De Voy that the firebox sheets fail—(I presume by failure you mean cracking of sheets), due to the water being kept away from the sheet. I do not think, however, that it is kept away principally by defective circulation. I am hardly prepared to think that that has very much, if anything, to do with the matter of firebox failures.

First, about these two currents in the inside water leg that Mr. Seley mentions, an upward current along the inside sheet and a downward current along the outside sheet. I am inclined to think that we have simply the one upward current. As far as I can see from the evidence, we do not really know. My observation would lead me to believe that the current is entirely backward along the barrel of the boiler, close to the two sides and ending up in the back; that is, the water that is evaporated from the firebox goes backward from the barrel. Anybody who watches the deposit of mud in the boiler will find there is no mud along on the front mudring; it will accumulate along on the back mudring and on the back ends of the side mudrings, showing that the circulation must be rapid in the throat and be very slow when it gets in the back water leg.

As regards the reasons for overheating the sheets, I have rather concluded, from my own observation of the matter, that the water is kept away from the metal by the formation of scale or by the deposit of mud. If the metal is kept perfectly clean and free from scale, some tests I made indicate that the metal can not get very much hotter than the water; in fact, I got an increase of temperature of perhaps 50 degrees, about the temperature of the water, but allow scale to form, and particularly a thick scale, and the metal can actually come to a red heat. When a firebox sheet becomes corrugated, for instance, I take that fact as an evidence that the metal has become red, otherwise it could not get into that wavy condition, because the metal has plenty of resistance until it does become red, and when we consider the large mud accumulation that may occur in this part of the boiler, we can easily understand that the water can be kept away sufficiently to allow actual burning of the metal.

Now, in fireboxes where we have trouble with corrugated sheets, we practically always have staybolt troubles also, but we find where we treat the water so as to avoid all the scale formation and avoid foaming and mud accumulation by heavy blowing, we avoid this formation altogether, we find we have practically no corrugated side sheets and we have practically no leaky staybolts.

MR. DE VOY: I said one thing that possibly might be misconstrued. Now, the first requirement of locomotive boilers is proper washing; that is one of the essential features, so do not think that I mean that changing the water, when I spoke of changing the water or standing over ashpits, has all to do with it. Do not conflict that with boiler washing, because the boiler ought to be washed out, ought to be washed with warm water if we can do it; but a great many, nearly all of the cracked side sheets that crack 18 to 24 inches above the mud ring are caused by improper circulation of air on the inside of the firebox and by water between the firebox and the outside sheet on the road. Cracked side sheets have really occurred in the actual operation of the engine many and many a time.

MR. WICKHORST: Do I understand, Mr. De Voy, that you say cracked side sheets occur on the road, while the engine is running?

MR. DE VOY: Absolutely, and put the engine out of business, flood the firebox. Where would it occur, in the shop?

MR. WICKHORST: Why, yes. I have hunted up records of cracked sheets, and out of quite a bunch I found only two where it occurred where the engine was not cold at the time. About 70 per cent. of them were in the hands of the boiler washers and we have had them occur right in the shop, when nobody was working on the boiler. I give below some extracts from my paper before the American Society for Testing Materials in 1906, which may be of interest in this connection:

Conditions of Failures Classified.

About two years ago a lot of records and papers concerning failures of firebox sheets were gathered out of the files in the superintendent of motive power's office of the Chicago, Burlington and Quincy Railway lines east of the Missouri river, and a classification made of the conditions under which the failures occurred, with results as shown below. These failures include only those occurring as ruptures, or sudden failures.

	Number.	*Per cent.*
1. Washing—Cooling	3	7.7
2. " Using nozzles	16	41.0
3. " Filling	2	5.1
4. " After filling.......	7	17.9
5. In shop or house, cold.......	7	17.9
6. In house, hot...............	2	5.2
7. Discovered arriving at terminal	2	5.2

It will be noted from the above that 71.7 per cent. occurred while the engine was being washed, this including 41 per cent. where nozzles were being used at the time; 17.9 per cent. occurred while the engine was cold under other circumstances, making a total of 89.6 per cent. for the failures while the engine was cold, and thus leaving 10.4 per cent. for such failures while the engine was hot, but it is not improbable that if the full details were at hand of the conditions attending the failures in these latter cases, that in some or perhaps all, the records would show the engine had been cold. When washing the boilers, cold water had probably been used in all cases, and the above figures would seem to argue very strongly in favor of keeping the boiler continuously hot, and to use a method of washing out where the boiler does not get cold, say not below 150 degrees Fahrenheit.

Temperature Tests of Firebox Steel.

If the metal is at any time heated to a red heat, or to near a red heat, failure from this cause would be the natural result, and in order to get some information concerning the temperatures actually attained by locomotive firebox sheets, etc., under condition of service. I arranged to get an electric pyrometer consisting of a platinum thermo-couple and galvanometer, and the intention was to work the boiler at rates similar to service conditions, and insert the junction of the thermo-couple through a small hole drilled in a staybolt, extending across to near the fire side. Tests of this kind have not as yet been made, but some preliminary results have been made with the apparatus shown herewith as Fig. 1. From this it will be seen that the method of test consists of boiling water in a can with thin sheet steel sides, with a bottom of half-inch boiler plate, four inches in diameter brazed to the sides. The boiler plate has a hole drilled into the side one-eighth inch in diameter extending to the middle of the plate. Heat is supplied by a specially constructed "Pepper Box" burner which gives a lot of gas flames over a flat circular area of about four inches in diameter. The junction of the thermo-couple is inserted into the hole of the plate to the middle, and the temperature is read on a galvanometer. Some preliminary results are shown in Fig. 2, from which it will be noted that if a firebox sheet (including flue sheet) or the flues are free from scale or mud, the temperature of the metal probably does not at any time exceed the temperature of the water more than 50 degrees Fahrenheit, providing of course the circulation is sufficient to keep the water always in contact with the metal. Under the conditions of this experiment, with no scale or water on the plate, the metal attained a temperature of about 1,300 degrees Fahrenheit, and it will be noted from the diagram that with one-eighth inch scale the metal attained a temperature of about 200 degrees above the temperature of the water; with one-quarter inch something over 400 degrees.

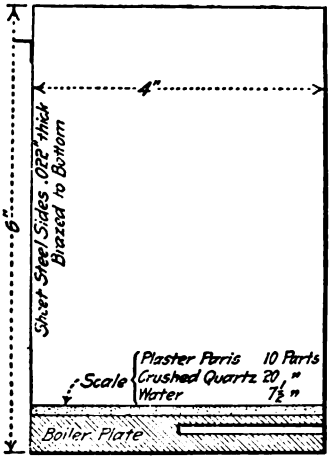


Fig. 1. Temperature Tests of Firebox Steel Apparatus

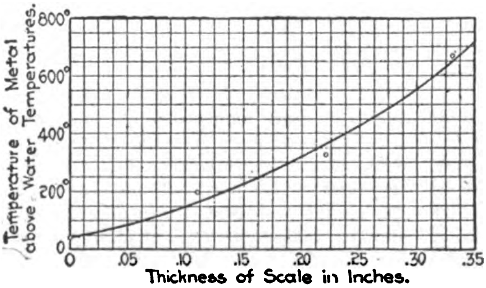


Fig. 2. Temperature Tests of Firebox Steel. Curve of Results

In a locomotive firebox, the average temperature of the metal, if not protected by the water, would probably run between 2,000 and 3,000 degrees Fahrenheit, and with scale one-eighth inch thick and with water in the boiler, the experiments indicate that the metal, including firebox ends of the tubes, can readily attain a temperature several hundred degrees above the temperature of the water, and it is not unlikely in some cases that the metal actually attains a low red heat.

Mud Accumulations.

The action of the heat causes the water to flow upward between the tubes, and the countercurrent must flow downward between the tubes and shell of the boiler. The water evaporated from the side and other sheets of the firebox is probably supplied mostly by a current flowing backward along the bottom of the barrel of the boiler. When this current reaches the flue sheet it divides, half going to each side water leg, the current finally ending in the back water leg where the two side currents meet. Of course while this backward movement of the water is going on, the formation of steam also maintains an upward movement. This circulation carries all solid material that is light enough to move with the water into the back water leg, where the circulation is probably least rapid. The heavier particles of mud and very light scale deposit on the back mudring up as high as the fire line, which is about six inches above the mudring. There is on the back mudring a cubic foot or so of quiet water space into which the mud and lime sludge is first carried, and when this space is filled up, deposits accumulate on the side mudring and finally accumulations may occur on the front mudring. Critical examination of the mud deposits in a boiler after the water is drawn out is apt to show very little if any mud on the front mudring, and a depth of six or eight inches on the back mudring, with more or less mud on the sides. No mud is apt to be present in the barrel of the boiler, as determined by a view through an inspection hole in the back flue sheet under the flues. Where there are also scale deposits, these will be found mostly in the barrel of the boiler and on the front mudring, as scale is too heavy to be carried round by the circulation, but the mud deposits will be found about as I have described above. The usual scale and mud deposits are illustrated in Fig. 3. Up to a height of four or six inches above the mudring, the mud accumulations remain below the fire line and cannot cause overheating of the sheets, but if more mud is allowed to accumulate in a boiler it cannot be taken care of in this space. Such excess mud makes more or less trouble by keeping in the water circulation, depositing quickly on the tubes, crown sheet and particularly in the side and back water legs as soon as active steam production stops, and in

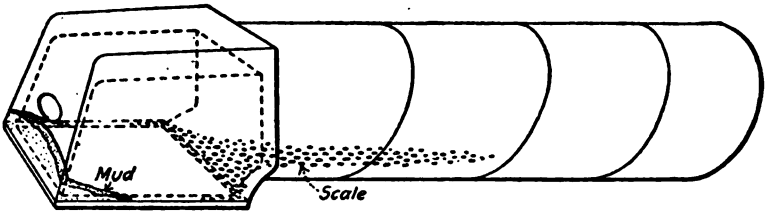


Fig. 3. Mud and Scale Accumulations

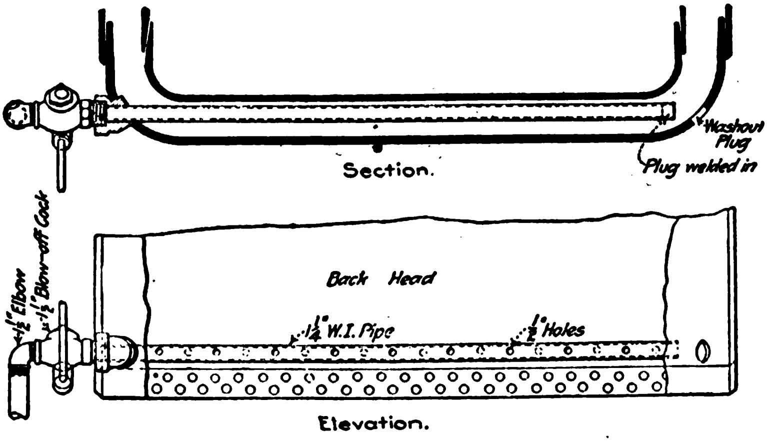


Fig. 4. Blow-off Pipe in Back Water Leg

this way is apt to cause overheating of the side and back firebox sheets by preventing free access of water.

If by means of a blow-off arrangement the back mudring can be kept free from mud, it would seem clear from the above considerations that the boiler can be kept free from excessive mud accumulations, since all the mud is carried by the circulation into the back mudring. A blow-off in the middle of the back water leg right above the mudring removes mud from where it tends to accumulate most, but experience has shown the author that the mud is removed right around the blow-off cock, but on either side the accumulations are not disturbed. This led to trial of blow-off pipe laying on the full length of the back mud ring and perforated with holes spaced about four or six inches apart. This arrangement has been tried somewhat extensively and experience shows that mud can by this means be thoroughly removed from the boiler without the necessity of cooling down the boiler and washing.

Where water is treated with soda ash, the function of the soda ash is to cause the lime and magnesia salts to come down as a sludge instead of adhering as scale, and the circulation then carries the sludge into the back water leg, where it can be successfully removed through a perforated blow-off pipe placed on the back mudring. By a combination of treatment of water with soda ash, the perforated blow-off pipe mentioned and system of blowing out at terminals, engines can be made to run regularly 5,000 miles between wash-outs and without change of water other than obtained by the blowing out at terminals. A perforated blow-off pipe arrangement suggested for general use is shown in Fig. 4.

THE CHAIRMAN: Prof. Breckenridge, may we hear from you on the subject?

PROF. L. P. BRECKENRIDGE (Univ. of Illinois): Mr. President, I feel that I ought not to say anything to the Western Railway Club on this subject.

I have long wished that we could have boilers with glass windows so that we could look in and actually observe some of the things that we guess are happening inside. Just how the water goes up or down the water legs of a locomotive firebox, is, I think we all agree, much in doubt, so that this particular question which you are discussing, the life of the firebox as affected by its shape, and the water circulation, is difficult to discuss.

I should like to say a word about the matter of the transmission of heat through metals. It is a matter that has been given some attention in the last few years, and the government tests referred to by the author of this paper have brought out some interesting results. These tests were made to determine the influence of the velocity of the hot gases over the surface as affecting the evaporation. It was found that a rapid increase in the circulation of the gases over the heating surface of the boiler brought about a much higher evaporation per square foot of heating surface in a small boiler in which these tests were made.

We are not, I think, to assume that the evaporation per square foot of heating surface is really augmented by this increase in the velocity of the gases, except in so far as this velocity does have a certain sweeping action over the surface of the metal with which it comes in contact, which results in replacing the cold particles of the gases, which have become cold because they have transmitted their heat to the shell and into the water, by hotter gases which take their place, because of course it is true that the thing which determines the amount of heat which shall be transmitted to the square foot of heating surface is the cause of the temperature of the two sides at the surface.

In many experiments on heat transmission presented to us from time to time, it has been assumed, wrongly, I think, that the temperature of the sheet itself was at the temperature of the gases measured by a thermometer six or eight inches away from the sheet, and that the temperature of the other side of the sheet was at the temperature of the water which we hoped was in contact with the surface. In many instances these assumptions have been wrong, so that in this instance increased evaporation per square foot of heating surface has doubtless been brought about by making the hot side of the surface a great deal hotter than the actual temperature which existed before, when the gases circulated slowly.

I have always had the greatest respect for the locomotive firebox. I have always had the greatest admiration for the designers who have undertaken to solve the problem which presents itself in the construction and in the destruction of the locomotive firebox. There are few pieces of metal used in connection with boilers which have harder duties to perform than are found inside of the locomotive firebox, for reasons with which you are very well acquainted.

I have also had the greatest respect for the performance of a locomotive boiler, knowing the conditions under which it is operated, and I have concluded in the last few years that much of the good performance of a good locomotive boiler was due, in a measure at least, to the rapid, sweeping flow of the hot gases from the firebox to the front end.

We burn a very large amount of coal per square foot of grate area, and for every ton burned we discharge from sixteen to twenty-four tons of gas at a high velocity through the tubes. It seems to me that this sweeping action of the gas at the high velocity is one reason why the locomotive has performed as well as it has under conditions which certainly are not altogether best for economical performance.

While the high velocity of the gases on one side of the boiler plate or tube and the rapid circulation of the water on the other side may have considerable effect on this question of heat transmission, it occurs to me that the influence of the gas velocity will have a larger effect than the influence of the velocity of the water, and in about the same proportion as the specific heat of the gas and the water. I believe you will find it more effective to increase the velocity of the gases than to increase the velocity of the water. The circulation of the water should, however, be made rapid as possible by any shapes, inclinations or well proportioned area that can be chosen.

We have had set up in our steam laboratory during the last four months a small apparatus which permits us to force water at varying velocities through a tube and transmit heat to the water from a constant source of supply. The experiments thus far indicate that there is advantage to be gained from a rapid circulation of the water, but our experiments have not yet been carried on with any such high temperatures as are found in the locomotive firebox. It is clearly evident that any boiler which is to give the maximum rate of heat transmission through the surfaces, the greatest capacity and perhaps therefore the highest commercial efficiency will be the one that has a very high gas velocity passing over the surface on one side of the plate and a high water velocity passing over the surface on the other side. A very large part of the heat that goes into the water of a locomotive goes in directly by radiation to the plates of the firebox, and the above remarks have no bearing upon this part of the heat transmitted.

MR. DE VOY: May I ask just one question, because I am very much interested in this? I understand all parts of Prof. Breckenridge's remarks, with the exception of his way of taking the temperature inside the firebox by means of any gauge known. The reason I say that, and I ask merely for information, for the reason that it is about fifteen years ago a test was made by the superintendent of motive power of the West Shore, who was at that time chairman of the master mechanics' committee on boilers. He sent me to Dr. Thurston, of Cornell University, and he told me the only way he knew was to take a dozen or more fire bricks, about that shape (indicating), throw them in the firebox, pull out and drop them into a tank of water, which we did. Now, I have heard of measuring the temperature, say 18 inches above the grate on the outside of the fire, inside of the firebox, but I do not know of any way it can be done, and I would like to be put straight on that, because I do not believe Prof. Breckenridge referred to it.

PROF. BRECKENRIDGE: The answer would take a long reply, and I suspect we cannot take time for it this evening. The art of measuring temperature has advanced in the last fifteen years a great deal and we now undertake to measure with a satisfactory degree of accuracy any temperature which can be produced by the burning of fuel up to 4,000 degrees, Fahr. The optical pyrometer is now successfully used for measuring temperatures in fireboxes and furnaces of all kinds. The construction and operation of these instruments is something I cannot go into at this time. An article entitled Practical Pyrometry, by Mr. Robert S. Whipple, in the Journal of the Western Society of Engineers for April, 1907, contains much of interest in connection with this subject.

THE CHAIRMAN: Mr. Manchester, may we hear from you?

MR. A. E. MANCHESTER (C., M. & St.

P. Ry.): The subject of boiler construction is always a prolific theme with motive power people; but I feel more like listening than I do like talking tonight. I am in about the same position as was the son of General Prentiss. In his lecture on the battle of Pittsburg Landing, General Prentiss tells the following story: His boy, fifteen years of age, was along with them and when the battle began, the boy drifted away from the division and later in the afternoon was found by a friend near the landing, or as far from the firing line as he could get. He was asked: "Johnnie, what are you doing here? Why are you not down at the front along with your father?" His answer was: "Not much, there is enough of our family down there now." (Laughter.)

MR. DE VOY: I don't know whether the boss is joshing me or not, but it is all right. He has 250 of those boilers in service, and a man's actions speak louder than words.

THE CHAIRMAN: Mr. Kilpatrick, have you something to say on this subject?

MR. J. B. KILPATRICK (C., R. I. & P. Ry.): I do not know that I have anything particular to say on the subjest, as far as the type of boiler shown on the blue print is concerned, because I know very little about it. The road with which I am connected does not use it. I think a great deal of the trouble in fireboxes is due to the abuse of the metal, as well as the quality of the metal. The gentleman spoke about fireboxes cracking in the shop. I have known of fireboxes cracking forty-eight hours after the boiler was cooled. I think it is true that these cracks develop from the severe service to which fireboxes are subjected.

THE CHAIRMAN: Mr. Webb, this is a subject in which I think you are interested.

MR. E. W. WEBB (Mich. Cent. R. R.): I do not remember of a firebox cracking out on the road. I was on an engine for about twenty-one years and since then have gone into the shop. My experience is that they crack in the shop. It was only recently that on making inquiry in regard to a certain engine that had been held in for repairs it was found that the firebox side sheet was cracked; it did not crack on the road, that is very certain; it cracked in the shop.

Our experience with the wide firebox engines is very much the same as that on other roads, except that our flue mileage in the wide firebox is very good; it runs way up into the hundred thousand miles on the Pacific engine; the Atlantic type engines very much the same. The Pacific engines are better on flues than the Atlantic type, the Pacific engine flues running twenty-one feet, while the Atlantic are considerably shorter. About the water in the firebox—washing the boilers, of course we are all familiar with the necessity of that. I do not know that we have any engines in service with side sheets inclined the same as those shown on the blue print; at least, not to my knowledge.

THE CHAIRMAN: Is there any further discussion on the subject?

MR. W. C. SQUIRE: I would like to ask Mr. De Voy whether the side sheets of engines on his road crack in service, and also to ask Mr. Wickhorst in reference to the exact location of their locomotives when their side sheets break, that is, whether those cracks develop in the shop or when the engine is in service. Any of the gentlemen present who have had experience, and this includes Mr. De Voy and Mr. Wickhorst, in testing and inspecting metals know that sheets which break or crack as side sheets do, develop a crack that is exactly like that which is due more particularly to localized heating, because those cracks show a fracture such as is developed when we bend a piece of steel that indicates from such test "hot shortness." From all cracked sheets that I have seen the fracture indicated the nature of the break to be due to this same class of heat treatment. It is no doubt true that the audible report of a side sheet parting at the fracture is often heard when engines are laid up in the shop and boilers are cold, but I still believe that the crack was incipient or developed while the engine was in service and not while in the shop; in other words the coherence of the metal was destroyed in service, but there are local stresses set up in the sheets as the boiler becomes cold that cause the defective sheets to part, but the incipient parting or fracture was developed under service conditions, namely when the engine was working and fire was in the firebox.

MR. DE VOY: Am I supposed to answer that, Mr. Chairman?

THE CHAIRMAN: You may, yes, Mr. De Voy.

MR. DE VOY: All the cracks I have ever seen made in the firebox start about a quarter of an inch away from the staybolt. You examine a crack in any firebox and you will find that is about the way it is. I know of three cases, one was on an engine in service and the crack was so large that it put the fire out at that particular time and killed the engine. One thing I cannot understand is, what will crack a firebox forty-eight hours after it is inside the shop. That appears to be worse than my own theory, anyhow. You have got to show me. I realize just as well as anybody that there is not anybody who has built a boiler just like that, and I do say we have to put up with a good many stresses, but anyway, it is not theory, it is absolute practice.

THE CHAIRMAN: One of the older members, who has been in this business for a long time, we have not heard from in the Western Railway Club recently, and I would like to hear from him tonight, Mr. Cory.

MR. C. H. CORY: I think you will have to place me as a back number, having been out of railway service now for several years, and not up to date in this matter of new form of boiler furnace, this being my first introduction to it. I can recollect several years ago at one of our conventions—I cannot call to mind exactly who was on the committee on boilers and furnaces, but one of the parties was Mr. Samuel J. Hayes, then superintendent motive power of the Illinois Central Railroad Company. This committee made tests of the water circulations in the leg of boiler by inserting a gauge or test cock in the outside sheet of the furnace and screwed it through until it struck the inside sheet. The usual boiler pressure at that time was not to exceed 150 pounds. This gauge or test cock was screwed in the outside sheet about where the hottest part of the fire would strike the sheet on the inside. After they had unscrewed that gauge enough to break away from the inside sheet they found the intense heat on the inside of the furnace forced the water from the inside sheet and they would draw steam instead of water from the test gauge, and, if my recollections serve me right, before they could get a solid body of water the inside end of the gauge was three-eighths of an inch away from the inside sheet. Perhaps some of the other members of the association can remember as far back as that and perhaps not, but I have always remembered the report that was made at the time in connection with the operation and flow of water in the leg of boiler. I think the intense heat in the inside of the furnace would drive the water away from the inside sheet so that they would not get water until they got three-eighths of an inch away from it. I think that had a great deal to do with the overheating of the sheet, causing cracks, etc. I never knew of a sheet cracking in service on the road; the cracking of the firebox sheet was always in the shop. I have heard them crack with the report of a rifle, after the engines have come in perfectly tight and had no defects of the furnace that we knew of. They would usually crack from one staybolt to another and sometimes extend 20, 24 and 28 inches long. My experience is that it always occurred when the engine was cold and at rest in the shop.

THE CHAIRMAN: Is there any further discussion before we call on Mr. Seley to close this paper?

MR. F. D. FENN (The Crane Co.): I would like to be permitted to ask a question in connection with the statements Mr. Wickhorst made. I would like to ask Mr. Seley, Mr. De Voy, Mr. Wickhorst or Prof. Breckenridge where in their opinion is the best place in that boiler to locate the blow-off cock? Mr. Wickhorst made the statement that the mud accumulated in the back corners. I would like to know if he would recommend that as the best place to put the blow-off cock to relieve that situation?

THE CHAIRMAN: Will one of the gentlemen answer that question?

MR. WICKHORST: I might say that it is a matter to which I have given a great deal of attention. Our practice on the C., B. & Q. is to put a perforated pipe across the back mudring and attach a blow-off cock in the corner. On some of our smaller engines we use only a blow-off cock, which is put on the back sheet under the fire door down at the mudring.

THE CHAIRMAN: If there is no further discussion, we will call upon Mr. Seley to close the discussion on his paper.

MR. SELEY: Mr. Chairman, I think I have attained my object in getting a discussion on this rather interesting question. I do not know that our friend De Voy and myself differ very much; he did not worry my bubble theory very much, and I agree with his sloping the sheets, so that we will probably go off friendly.

The idea that I had in mind was simply to find some reason why, if the proposition is correct, that the modern wide fireboxes are lasting one-third of the life of the old-time boxes. In seeking for a theory, it occurred to me to consider those elements which contribute to ultimate failure, viz., the vibrations or the expansions and contractions or movements of the sheet in the performance of its duty. I do not know that I am right yet, not at all sure that I am, but at the same time, if there is successful performance of fireboxes about sixty inches wide, and boxes wider than that have not given as good performance, would indicate that the slope of the sheet due to the narrower width had something to do with it. Now, just how that works out; whether I am correct in supposing that that upward circulation against an outwardly inclined sheet assists in wiping off the steam bubbles and combining them with the current, transmitting the heat, warming up the entire body of water in the water leg, instead of permitting a curtain or film of steam which will contribute to overheating of the sheet, it at least seems to be a reasonable theory or explanation with some foundation for it.

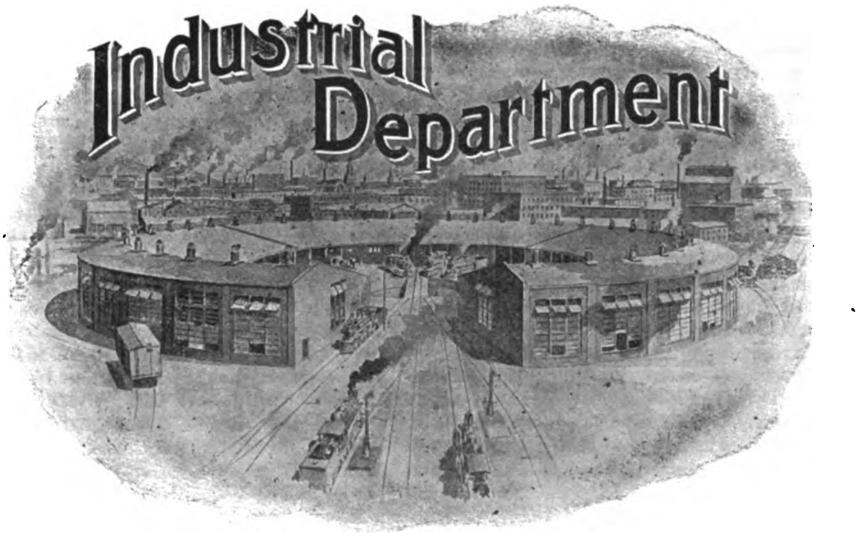
Whether Mr. Lawford Fry's theory of downward circulation or mine of facilitating wiping action of the circulation are used, the result is the same as regards the desirability of outward instead of inward inclination of firebox side sheets.

As regards Mr. Squire's inquiry about the solid water, it would seem to me that there is absolutely no possibility of a steam bubble combining with another and another and another until there is a film on any portion of the crown sheet, which is considerably beyond the vertical. Now, if the incline of the sheet was inward instead of outward, it would seem to me as though it would be more favorable for the formation of the steam film, as the effect of the circulation would have no scrubbing or wiping effect on that sheet, but if there is an incline outward, that upward rising tendency gives a wiping effect. Now, if the volume of the water leg is increased by greater width of water leg, I think it is reasonably sure that the rate of the circulation as a whole is decreased, due to that larger volume, and if the rate of circulation is a factor in keeping down the internal temperature of that sheet, the failures are in accord with my theory.

What I am trying to find out is this—you will probably all admit that a firebox sheet has a certain life, it will stand so many vibrations, so many expansions, so many contractions, from the normal, and then it will develop that crack that goes off like a pistol shot, or some other way, but at any rate there is a failure of the sheet. Now, if that is the cause, if we can lengthen out the period of time over which that amount of travel will happen, we get the increased life in our sheet. It seems to me that if the box is designed in such a way that the internal temperature of the sheet is kept down by keeping solid water against it by any means whatsoever, then with all of the fireboxes, even with the despised O. G., we have made a distinct gain. I think that this is a matter to think about and possibly to go into our records, to classify the fireboxes of different widths and angles and forms, and go back through our records for years and find out the number of fireboxes and side sheets that have been applied and see what results we obtain. I do not believe that it is due to the quality of firebox steel falling down necessarily; I think it is perhaps a matter of design.

As regards Mr. Wickhorst's belief that there is no downward circulation, or at least that there does not seem to be much to support that theory, I agree with that in a great measure. My idea of the circulation is that it is very rapid, upward, against the inside sheet and less rapid at the outside, so that a number of inclined lines, each of a greater angle, would express the velocity as I understand it. But I can hardly understand why water up at two-thirds of the height of the firebox against the outside sheet should come down. I cannot see why it will not rise, although at a very less rate than that of water that is close to the firebox sheet.

I think the paper has served its purpose, Mr. Chairman, and I am very glad to have had the interest of those who have taken part in the discussion.—December 15, 1908, meeting Western Railway Club.

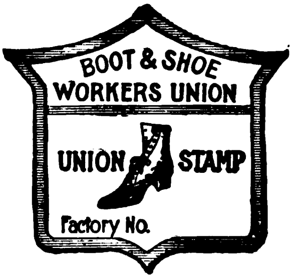


DISCUSSION OF CURRENT TOPICS

Pretended Friends Traitors to the Cause of Labor—They Trade on the Toilers' Troubles.

The controversy between the Douglas Shoe Company and the Boot and Shoe Workers' Union has constituted an effective test in determining that there is a small portion of the labor press that will weaken under temptation and, actuated by "business" considerations, will betray the cause of organized labor, which, under any and all circumstances, if true to its professions, it should support honestly, earnestly and sincerely. The Douglas Shoe Company, through one influence and another, has been busily engaged in endeavoring to create the impression that there is a division of opinion in the ranks of organized labor as to the justice of the present position of the Boot and Shoe Workers' Union, claiming that certain labor authorities have declared that that union was in the wrong and the company itself in the right. Under the pretext, therefore, that there are "two sides" to the question, a number of small so-called "labor" papers have taken up the cudgel in support of the position of the Douglas Shoe Company. Their motive for so doing is not hard to find. It can be seen in their advertising columns in the form of a very large Douglas Shoe advertisement, and let us say from our own experience (judging from the "business" that has been tendered the Magazine and declined) that the contract under which this advertisement has been given in all probability holds good for a year.

When the present controversy between this company and the Boot and Shoe Workers' Union began the Douglas Shoe Company in the hope of overcoming the effect of the loss of the Boot and Shoe Workers' Union label sought to advertise its product in about every labor paper in the country. Of course ever real labor paper declined to permit its advertising space to be used for the purpose of helping a company that was at war with a labor organization. The labor papers, however, whose proprietors could be influenced by mercenary considerations accepted the Douglas Shoe advertising contract and in addition thereto have been seeking ever since through their editorial columns to convince their readers that the Douglas Company is right and the Boot and Shoe Workers' Union is wrong. The efforts of these sheets to justify their position and the threadbare pretexts under which they try to make their acceptance of capital's bribe consistent with their profession of devotion to the cause of labor would be indeed pitiable were they not so utterly disgusting and so clearly evidential of a diabolic treachery which with brazen effrontery seeks to deceive that it may more easily betray. Notwithstanding that the Boot and Shoe Workers' Union has by its own regular and official action chosen its present position in this fight, the editors or owners of these little sheets constitute themselves judges of the controversy, and thus assuming the right to pass judgment on the merits of the dispute decide that the Boot and Shoe Workers' Union is wrong and the Douglas Shoe Company is right and, having so decided, complacently proceed to the publication of the latter's advertisement. As to the compensation received for such advertisement, of course that is not a consideration—no! perish the thought. It is as Shakespeare says, "mere trash." 'Twas the Douglas Company's, 'tis theirs and has been slave to thousands, etc., etc. Of course, principle—the desire to be "fair" (profitably "fair") is all that actuates these gentlemen in taking refuge behind the indorsement of some central labor union which made them an "official" labor publication the better to advance their "business" interests at the sacrifice of the cause which they thus profess to advocate. Such base commercializing of the life and death struggles of organized labor with the forces of greed; particularly by publications professing to be advocates of labor's cause is nothing short of cannibalistic, and the sooner that such sheets are given to feel that it is so regarded by wage-earners generally the better will it be for the trades union movement.



Buy no Shoes unless they bear this Label

Some of these periodicals, in their eagerness to be "fair" in the interest of the Douglas Shoe Company, fly for refuge to what they had been pleased to term "The Duncan Letter," an unauthorized and unjustifiable expression of the personal opinion of an individual who happens to be an officer of the American Federation of Labor, and which was written on the stationery of the American Federation of Labor without proper authority. This we say because of the fact that the A. F. of L. official letterhead under which the letter appears is apparently being exploited more extensively in carrying out the purpose of the letter than is the letter itself.

These little papers, for they are generally of the four-page standard, are as a rule owned by private individuals who have succeeded in having them adopted as the official publication of some one or other central labor body, and were it not for this fact it is safe to say that they would never have had an opportunity to publish the Douglas Shoe Company's advertisement. Such treachery is absolutely revolting, and it is about time that every trades unionist should take a stand against industry of "grafting on labor's troubles."

The Boot and Shoe Workers' Union is a sovereign entity in the industrial world. Those of its members who are engaged in the struggle with the Douglas Shoe Company are in a better position than any one else to understand the conditions prevailing in the factories of that firm. It is not for any member of any other labor organization or any publication professing to be a "labor" paper to say whether the Boot and Shoe Workers' Union is in the right or in the wrong. It is for them to support the Boot and Shoe Workers' Union with all their power and influence while the struggle lasts, and at all times to patronize it by promoting by every honorable means the sale of none but union label shoes. It should be enough for every right-minded, honest and sincere trades unionist and for every real friend of the trades union movement to know and understand that the Boot and Shoe Workers' Union has been forced to take a vigorous stand in the defense of the rights of its members to insure their vigorous support of that union in its present position.

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A Well Known Firm Changes Its Name.

The firm name of the Henry W. Price Co., Rockford, Ill., manufacturers of the "Price" line of gloves, has been changed to Fried-Ostermann Co., and a radical change has been made in the policy of the company.

E. C. Ostermann says that "The watchwords of this concern, in the future, will be 'quality, progression and aggression'—and 'quality' is going to have precedence over everything else. Although this change may come as a surprise to the dealers of the country the move was the result of no sudden notion on our part. Both Mr. Fried and myself have been connected with the Price firm for years and have long contemplated such a change."

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The struggle of the Boot and Shoe Workers' Union with the Douglas Shoe Company is still on. We can best assist our brothers of that organization by refusing to buy any shoes unless they bear the union label.

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Buck Stove and Range Company Injunction Modified.

Whether the modification of the Buck Stove and Range Company injunction by the Court of Appeals of the District of Columbia rendered on March 11th in a decision upon the appeal of the American Federation of Labor against the temporary injunction issued December 18, 1907, by Justice Gould of the Supreme Court represents a cautionary modification of judicial despotism in dealing with matters pertaining to organized labor, or whether it was the genuine result of careful deliberation and an inherent desire to be just on the part of the court as the court saw the situation, is, of course, problematical. Whatever cause, however, actuated the modification it is gratifying to know that the tendency of the court was in that direction. This judicial action, however, did not reach far enough nor will future judicial action reach far enough until the constitutional rights of free speech and an absolutely free and untrammeled press are re-established permanently, and not until then will labor be satisfied in this particular.

The action of the court in modifying the Buck Stove and Range Company injunction is ably discussed in an editorial by President Samuel Gompers, of the A. F. of L., appearing in the April issue of the Federationist, and which is as follows:

"On March 11th the Court of Appeals of the District of Columbia rendered a decision upon the appeal of the American Federation of Labor et al. against the temporary injunction which Justice Gould, of the Supreme Court of the District of Columbia, had issued December 18, 1907, upon the petition of the Buck's Stove and Range Company; made permanent by Justice Clabaugh.

"The decision greatly modifies the original injunction. It eliminates the prohibition of free press and free speech as to printing or discussing *anything* in relation to the Buck's Stove and Range Company or discussion of the injunction itself. It, however, still restrains freedom of the press in that it forbids the publication of the "Buck's Stove and Range Company" on the "We Don't Patronize" list and enjoins the boycott. This decision of the Court of Appeals and the accompanying opinions form a most important addition to the history of judicial action in relation to labor.

"Justice Robb and Van Orsdel concur in the decision, though giving widely different opinions, and Chief Justice Shepard dissents. . . . .

"The reasoning of Chief Justice Shepard, who dissents from Justices Robb and Van Orsdel, shows that study of modern industrial conditions which is so often lacking on the part of the judiciary. His argument on free press and free speech is a veritable classic and will live for all time, and though the minority opinion in this case, yet we believe its reasoning will at no distant day become the ruling of the courts on the issues involved. . . . .

"On account of the fundamental issues of free press and free speech, which were involved in the original injunction, we preferred to stand upon the unconstitutionality of the injunction rather than obscure this great issue by going into the details of the original trouble with the Buck's Stove and Range Company and the manner in which the boycott was carried on. . . . .

"Justice Van Orsdel, in defining a legal boycott, says:

"'Again, we do not assume that it will be contended that a citizen has not perfect freedom to deal with whom he pleases, and withhold his patronage for any reason that he may deem proper, whether the reason be one originating in his own conscience, or through the advice of a neighbor, or through the reading of an article in a paper. Neither would it be unlawful for such citizen to advise another not to deal with a person with whom he has concluded not to continue his patronage. If this advice may extend to one, it may to a hundred; and the thing done will not be actionable so long as it is an expression of honest opinion and not slanderous, however much the intercourse between this citizen and his neighbor may operate to injure the person against whom the advice is directed. . . . .

"'No one doubts, I think, the right of the members of the American Federation of Labor to refuse to patronize employers whom it regards as unfair to labor. It may procure and keep a list of such employers not only for the use of its members, but as notice to their friends that the employers whose names appear therein are regarded as unfair to labor. This list may not only be procured and kept available for the members of the association and its friends, but it may be published in a newspaper or series of papers. To this extent they are within their constitutional rights, at least, where a court of equity can not intervene.' . . . .

"Note what **Justice Van Orsdel** says further of the boycott:

"'I conceive it to be the privilege of one man, or a number of men, to individually conclude not to patronize a certain person or corporation. *It is also the right of these men to agree together, and to advise others, not to extend such patronage.* That advice may be given by direct communication or through the medium of the press, so long as it is neither in the nature of coercion or a threat. As long as the actions of this combination of individuals are lawful, to this point it is not clear how they can become unlawful because of their subsequent acts directed against the same person or corporation. *To this point, there is no conspiracy—no boycott.* The word "boycott" is here used as referring to what is usually understood as "the secondary boycott"; and when used in this opinion, it is intended to be applied exclusively in that sense. It is, therefore, only when the combination becomes a conspiracy to injure by threats and coercion the property rights of another, that the power of the courts can be invoked. *This point must be passed before the unlawful and unwarranted acts which the courts will punish and restrain are committed.*'

"The absolute fact is that this point never was passed in the boycott of the Buck's Stove and Range Company.

"The Union men and their friends expressed their intention not to buy Buck's stoves and ranges because that firm refused to grant its employes the equitable conditions and hours which the unions could obtain from other firms in similar lines of business.

"Union men notified local dealers that they did not intend to buy any more Buck's stoves and ranges. Also stated that they would transfer their patronage to firms which did not carry the unfair stoves.

"Never anywhere in the history of this boycott is there the slightest record of the union men or their friends attempting to 'coerce' third parties against their will to quit buying the Buck's stoves and ranges. . . . .

"*Under Justice Van Orsdel's definition of the boycott we state most truthfully, earnestly, and sincerely that at no time has any action of the unions exceeded what he lays down as perfectly legal.*

"A notice from the union men to the retail dealer that there was a boycott on the Buck's stoves and ranges was the only means of reaching the article as it came in contact with the retail purchaser. To notify the firm itself would accomplish no purpose, since it already knew the fact and had every reason to hide it from the retail dealers, and thus keep them in ignorance that organized labor and its friends would no longer buy the stoves. . . . .

"The sum of labor's offending seems to be that it has been too open and frank in its dealings. It could have ceased its patronage with precisely the same effect which has obtained and have left not the slightest evidence of how the result was accomplished. Its désire to save the retail dealer from the embarrassment of innocently loading up with boycotted stoves seems to have reacted as an evidence of 'conspiracy' and 'coercion' to ruin the dealer's trade. Just the opposite effect was sought by the friendly warnings, but as yet none of our judges seem to understand this phase of the case. . . . .

"Justice Shepard reviews the provisions of the original injunction which forbade the printing or distribution through the mails of the American Federationist if it contained any reference to the boycott and also prohibited any oral mention of the relations of the Buck's Stove and Range Company's affairs to labor, not only by the officers of the American Federation of Labor, but by any agent or attorney. On the general character of the original injunction he says:

"'*The sustaining of such a decree by a court of equity would violate the constitutional rights of the citizens.*

"'*It would mark the beginning of the era of judicial tyranny by the branch of the government charged with the duty of* *protecting the citizen in his constitutional and legal rights.*

"'*The clause in the constitution guaranteeing free speech and a free press was placed there to prevent a repetition of the abuses that had grown up in the monarchies of Europe, government censorship of the press.*

"'*It is folly to assert that this provision of the constitution is a mere inhibition on Congress from passing any law abridging the freedom of speech and the freedom of the press.*

"'*It forbids government censorship in all forms, and it would be difficult to conceive of a more effective method of establishing a government censorship than through the writ of injunction.*

"'*For the violation of its commands, the contemnor can be dealt with in the most summary manner—tried, adjudged, and sentenced by the judge whose order has been disobeyed.*

"'*The right of the citizen to express his opinions in the way of just criticism, either orally or through the press, is a privilege that can not be abridged.*

"'*This right is as essential to his liberty as the right to choose his calling. It may not be assailed even by the courts. The right is equally sacred whether exercised individually or in conjunction with others.*'

"Referring to the right to publish, Justice Shepard says, in paragraph 3 of his opinion, in regard to publication of the Buck's Stove and Range Company in the 'We don't Patronize List':

"'*Assuming that the publication of the Buck's Stove and Range Company in the "We Don't Patronize" column of the American Federationist was a step in the formation of a conspiracy to coerce independent dealers into refusing to have further business relations with that company, I can not agree that the publication can be restrained for that reason. Regardless of its character or purpose, the publication is protected from restraint, in my opinion, by the first amendment of the constitution which forbids any law abridging the freedom of the press.*'

"Justice Shepard even says:

"'So long, therefore, as the members of the Federation of Labor contented themselves with refusing to purchase the goods of the Buck's Stove and Range Company, from it or from others, their combination was not illegal.'

"If the notice of withdrawal of patronage is held to be unlawful coercion, we answer that such notice is not essential. Henceforth, in the observance of a boycott the union men and their sympathizers, it appears, have only to withdraw their patronage and say nothing about it to the merchant and they will be exercising their right strictly within the decision just rendered. . . . .

"This modified injunction more than hints that while the publication of the Buck's Stove and Range Company is enjoined in the 'We Don't Patronize List.' yet the use of that list itself is not enjoined, and the opinions seem to be that the American Federationist would not, under any circumstances, be denied the privileges of printing and mailing. So one wonders what would be done if we were to print the firm on the 'We Don't Patronize' list, and then use our admitted right to distribute the publication. Could we be adjudged in contempt in the face of these decisions? An interesting question, surely.

"The decision does not clearly uphold the right to boycott even in accordance with its own logic.

"But in view of the false premises and fallacious reasoning by which the courts for years have been extending the abuse of the injunction writ and by which a whole false superstructure of decisions have been reared, it is perhaps too much to expect that the Court of Appeals in one decision would recognize and define the full legal rights of the workers and thus overturn the consistently illogical and unjust line of injunction labor decisions for the past 20 years, but progress has been made. The workers will continue their struggle for justice in the use of the injunction writ until Congress and the courts fully recognize and safeguard those rights from all possible abuse. . . . .

"The legal right to strike recognized by the courts and the power to strike unquestioned, we find those organizations of workers which are best organized and equipped to strike, successfully, have very few strikes. The trade agreement and mediation and voluntary arbitration have largely replaced the strike. The right and the power to strike have compelled fairer consideration, and hence better conditions at the hands of otherwise hostile and inconsiderate employers.

"So with the boycott, cleared of wrongful charges and misapprehension and recognized as a lawful right, we will find its use diminishing. It will be a power held in reserve and used only when no other remedy seems adequate."

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Pay no attention to advertisements you may see in any of the few little so-called labor sheets that have been influenced by the advertising "business" of the Douglas Shoe Company to fight the Boot and Shoe Workers' Union. Such sheets deserve nothing but the utter contempt of every true Brotherhood man.

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New Department to Commence with This Issue.

Commencing with this number the Magazine will contain a new department to be known as "The Federal Government and the Railroads." It will be conducted by Bro. W. P. Borland, secretary of the Block Signal and Train Control Board of the Interstate Commerce Commission. This department will embrace the discussion of all matters pertaining directly or indirectly to the federal control of railroads, legislation bearing on railroad matters in any way, the functions of the Interstate Commerce Commission, its rules, authority, etc., and in connection therewith a question and answer department on all these subjects will be maintained. If any brother who desires information bearing on legislation pertaining to railroad companies, railroad employes, interstate commerce, etc., etc., or relative to any subject embraced in the entire field the new department covers, will send his inquiry to the Magazine office it will be answered therein.

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Read President Gompers' appeal in behalf of the United Hatters of North America, and give what you can to help them..

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William P. Henszey.

Mr. William P. Henszey, who was a partner in the firm of Burnham, Williams & Co., proprietors of the Baldwin Locomotive Works, Philadelphia, Pa., died at his home in that city on Tuesday morning, March 23d.

Mr. Henszey at the time of his death was in his seventy-seventh year, having been born September 24, 1832. Entering the works of M. W. Baldwin & Co. on March 7, 1859, as a draftsman he has continuously remained with that establishment and has been identified with its growth from a very small beginning to that of the greatest locomotive works in the world. At the time of Mr. Henszey's connection with these works less than 1,000 locomotives had been built, while at the time of his death the number exceeded 33,000. Mr. Henszey was a skillful designer, and symmetry and grace characterized his work. It was largely through his efforts that the standardizing of axles, driving and truck boxes, wheel centers, tires, eccentrics, etc., has reached such perfection.

In 1870, eleven years after connecting himself with the works, he became a partner. A number of patents on improvements in locomotives, boilers, reversing gear, frames, trucks, etc., have been taken out by him. Through his skill and efficiency he has done much toward the development of the locomotive from the simple machine of 1860 to the modern locomotive of various types and enormous dimensions and weights of present day practice.

It is said of Mr. Henszey that he was active in good works and that unfailing amiability and benevolence were his strong characteristics, and that the world little knows of the many benefits conferred by him on deserving causes. In the death of such a man the world suffers a real loss, but it is much the better for his having lived.

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Dr. Corwin's Explanation—Press Reports Misquote Him.

In an editorial entitled, "A Vile and Gratuitous Slander," the Magazine in the January issue took vigorous exceptions to certain charges against railroad train service employes appearing as the expressions of Dr. R. C. Corwin in the daily newspapers of the country. Dr. Corwin is division surgeon of the Missouri Pacific Railroad at Pueblo, Colo., and the charges referred to were attributed to him by the newspapers as part of a paper or article he read on November 17th last before the New York and New England Association of Railway Surgeons.

The Magazine felt fully justified in accepting the report of Dr. Corwin's criticisms as given by the press as correct and consequently resenting them because, up to the time the January number went to press, he had made no public denial or explanation of them, nor had he, as far as we knew, denied or explained them in private.

Dr. Corwin's alleged attack was resented at the time, not only by the Magazine, but by the journals of all the railroad orders and by many other labor publications as well.

In a letter recently received from Dr. Corwin that gentleman advises the Editor that the report of his address as appearing in the press misrepresented his real utterances; that it was not correct and did not in any way reflect his ideas regarding railroad employes and railroad managements; that his motive was to aid railroads and their employes, and his only object was to criticise the doctors, as he believes that the doctors can be much more useful than they are if given an opportunity to inaugurate proper prophylactic methods.

As a matter of fairness to Dr. Corwin we take pleasure in publishing the foregoing.

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ANOTHER JUDICIAL OUTRAGE—CANADIAN BROTHER SENTENCED TO JAIL

Once again has the judiciary recorded its hostility to labor, and in flagrant disregard of common justice has sentenced to a felon's cell a member of our own Order. Once again with much bombast and circumstance has Justice Riddell, of Canada, sentenced a railroad man to prison, and once again has that gentleman demonstrated his absolute unfitness to occupy the important position of judge, for it was this same Justice Riddell who, in the fall of 1907, sentenced Conductor Joseph Thompson, of Guelph, Ont., to a term of three years in the Provincial penitentiary, Conductor Thompson having been found guilty of a charge of responsibility for a wreck which occurred on the Grand Trunk at Gourock several months previous and in which three lives were lost.

The brother who has this time felt the weighty hand of judicial despotism is Engineer Conrad Kennedy, who on a charge of criminal negligence was sentenced by the aforesaid Justice Riddell to a term of eight months' imprisonment in the Guelph jail.

On January 27th last Brother Kennedy, engineer, and Bro. Frank T. Lane, fireman, as the crew of engine No. 584, left Stratford, Ont., at 5:30 a. m., hauling a way freight bound for Owen Sound, in charge of Conductor M. Fleming. All went well until when leaving Harriston instead of taking the curve for Owen Sound, for which four blasts of the whistle should be given, they took the straight track for Southampton (see accompanying diagram). They gave four blasts of the whistle to go to the pork factory while switching, the factory being situated on the branch leading to Owen Sound. On coming back for their train, intending to pull right out, they took it for granted that the switchman had left the switch open for them, but he had closed it after they had backed over it, so of course they did not notice they were taking the wrong track. They pulled up and left immediately, and, as a very severe snow storm was raging at the time, they failed to notice that they were taking the wrong track and proceeded three miles, meeting engine No. 311 pulling the Southampton way freight. On realizing that a collision was inevitable Brothers Kennedy and Lane jumped from their engine, being surrounded by the debris of the wreck which followed the collision. The fireman of engine No. 311, Bro. Maumer Root, of Wellington Lodge 181, and a brakeman of the Southampton way freight were killed and the engineer injured. Brother Lane had his shoulder badly hurt, but Brother Kennedy escaped without injury. At the time of the collision the entire train crew was in the caboose eating dinner. On February 8th Brother Kennedy and Conductor Fleming were arrested on a charge of manslaughter, which was afterwards reduced to one of criminal negligence, and the brothers of Brother Kennedy's lodge, Avon No. 38, secured bail for Brother Kennedy in the sum of $4,000. On February 15th Brother Lane was also arrested on a similar charge and the brothers secured bail for him also in the sum of $4,000. Both Brothers Kennedy and Lane appeared for trial and their cases being postponed they were admitted to bail in the sum of $4,000 each. The three brakemen were also arrested on the same charge and were likewise bailed out.

On February 23d the entire train and engine crew were found guilty by a jury and March 6th was set as date for passing sentence. The brakemen were let go on a suspended sentence at the trial. On March 6th Justice Riddell sentenced Brothers Kennedy and Lane and Conductor Fleming. Brother Kennedy was sentenced to eight months without hard labor in the Guelph jail, and Brother Lane and Conductor Fleming were let go on suspended sentences with bail of $5,000 on their own recognizance and two bondsmen of $1,000 each.

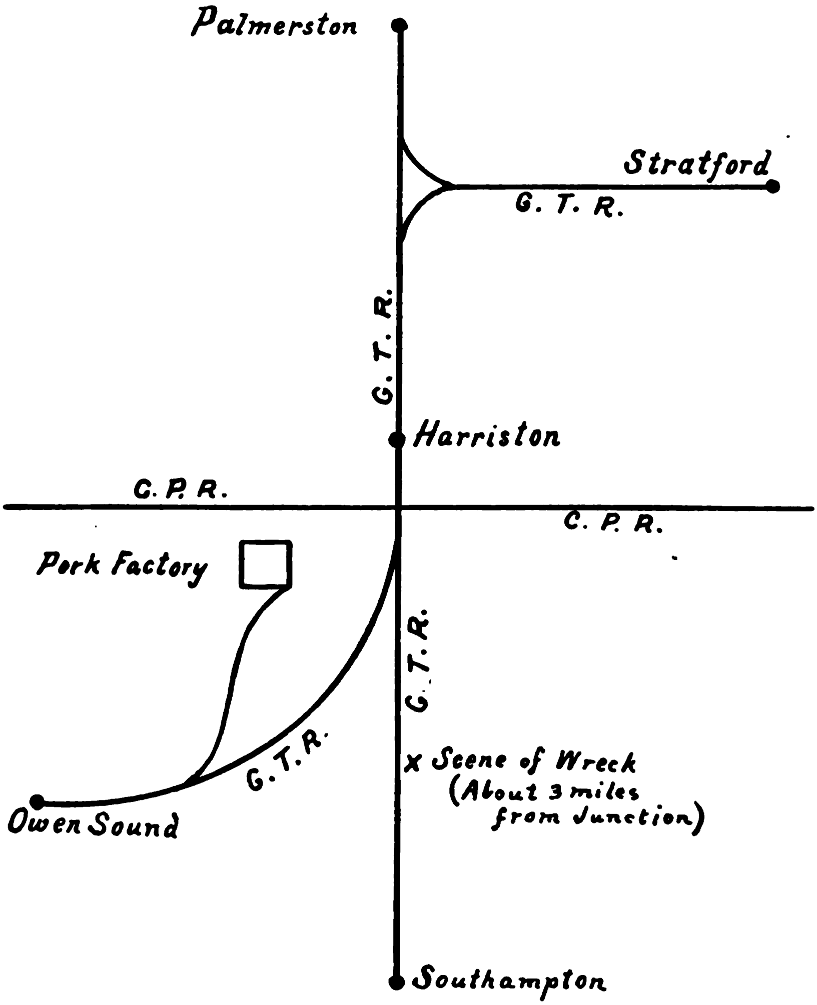

Diagram Showing Scene of Wreck

From Stratford comes the news that the boys of Lodge 38 are seeing to it that Brother Kennedy wants for nothing; that they are supplying him with every comfort and every source of entertainment that jail regulations will permit of;

nor this alone, but they have stood nobly by him in his trouble all through and spared no expense in their efforts to help him. This is certainly a true and practical exemplification of the word fraternalism. In thus standing by Brother Kennedy the boys of Lodge 38 are demonstrating what the word brotherhood means, and there is nothing that can be more comforting or more consoling to him in his present trouble—there can be nothing which can rob his incarceration of its humiliation so effectively as the realization of the fact that he enjoys the confidence, the good-will, the respect and genuine heartfelt sympathy of this brave and generous band of brothers in his trouble and persecution, for persecution it certainly is to add the humiliation of imprisonment to the misfortune of a man who, through a mistake, is responsible for a railroad accident. That it is persecution pure and simple must be clear to anyone who will stop to consider that this mistake involved the danger of loss of his own life as well as of his position, and that he was therefore totally unconscious of doing wrong when he made such mistake. To send a man to jail under such circumstances is a contradiction of our claims to civilization and a mockery of justice.

The generous loyalty, the true fraternal fidelity of the brothers of Lodge 38 in standing by Brother Kennedy as they have done is evidence of that sentiment in our organization which makes it truly and really a Brotherhood in fact as well as in name.

Popular sentiment in Stratford is on the side of Brother Kennedy, as people generally realize the rank injustice of sending him to jail because of his responsibility for an accident which they realize he would no doubt have given his life to avert had he had any knowledge of the liability of its occurring, and which involved to himself loss of position and danger of death or great bodily injury. As a consequence, the following petition in behalf of Brother Kennedy from the citizens of Stratford has been forwarded to Hon. A. B. Aylesworth, Minister of Justice:

"*To the Honorable A. B. Aylesworth, Minister of Justice:*

"We, the undersigned citizens of the city of Stratford and vicinity hereby petition you to recommend the grant of a pardon or the shortening of the sentence of Conrad Kennedy, recently sentenced to eight months' imprisonment in Guelph jail for an omission of duty under section 284 of the Criminal Code.

"We pray for clemency on his behalf on the grounds that he has always been of good character, that prior to the accident in question his record for carefulness in the performance of his duties as a railway man was of the highest and that he has out of his earnings supported his aged father and three sisters who by reason of his imprisonment are now deprived of that means of support."

Merits of the Case from a Standpoint of Law and Justice.

The sections of the Canadian Criminal Code under which these persecutions of railroad men are taking place are as follows:

"Section 283. Everyone is guilty of an indictable offense and liable to two years imprisonment who, by any unlawful act or by any wilful omission or neglect of duty, endangers or causes to be endangered, the safety of any person conveyed or being in or upon a railway or aids or assists therein.

"Section 284. Everyone is guilty of an indictable offense and liable to three years imprisonment who, by any unlawful act, or by doing negligently or omitting to do any act which it is his duty to do, causes grievous bodily injury to any person."

It is certainly difficult to understand how under a just and fair interpretation of these sections a court can find a man guilty of crime and sentence him to imprisonment for commission of an act which, were he in the most remote degree aware or even apprehensive of the liability or the danger of its occurrence, he would have exerted his every effort to have prevented; unless it is that the court in the pompous exercise of "discretionary" power feels that it is at liberty to entirely dispense with justice in the premises. The exercise of such discretionary power is evidently one of Justice Riddell's chief stocks in trade as a jurist—at least in his dealings with railroad men who are unfortunate enough to come before him on charges of negligence in the performance of their duty.

The sentencing of Brother Kennedy has aroused a popular sentiment against the law under which railroad train service employes can thus be humiliated that is more than likely to lead to a strong movement looking to the repeal of that statute, and another result of this movement may be the removal of Justice Riddell from the bench; at least it is to be hoped that such a result can be accomplished, for he has, as is clearly evident to all fair-minded persons, shown his unfitness for the exalted position he now holds. In referring to petitions presented to him by citizens of the city and vicinity in behalf of Brother Kennedy he said during his "speech" when sentencing that brother:

"I should add that to a number of the petitions handed in to me I can pay no attention. Persons who express an opinion that those violating the law should not be prosecuted because of their good character show an ignorance of the first duties of a law-abiding citizen, and ask for one law to be applied to those they approve and another to those they do not.

"I can only hope that such petitions were signed through inadvertence, and without a full sense of what they imply; it is, of course, notorious that this often happens.

"The drafting of the petitions must have been done by some one ignorant of the genius of our institutions, and our law-abiding principles—it is impossible for me to believe that the mind which conceived and the hand which drafted such petitions could have been those of a Canadian."

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Buy none but union label shoes. If the members and friends of organized labor will demand union label shoes the Boot and Shoe Workers' Union will win its fight with the Douglas Shoe Company.

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One Organization for Trackmen and Other Maintenance of Way Employes.

Under an amalgamation agreement the International Brotherhood of Maintenance of Way Employes has taken over the entire membership of the National Union of Railway Trackmen, whose headquarters were at Ft. Scott, Kansas, and consequently there is now but one organization of recognized standing, composed of trackmen and other maintenance of way employes.

The two organizations parties to the amalgamation represented the same class of workingmen and the same common interests and the wise and logical thing for them to do, therefore, was to consolidate, thus uniting their forces and devoting their entire strength to the advancement of the common interests they represented.

The International Brotherhood of Maintenance of Way Employes. is recognized by railroad officials, having agreements on some thirty roads. Now that the rivalry and contention that naturally existed between both organizations has given way to co-operation, union and harmony the thorough organization of the trackmen and men of other occupations eligible to membership in the ranks of the I. B. of M. of W. E., the substantial improvement of their employment conditions will be the natural consequence.

To the new organization the Magazine extends its sincere congratulations, and our expression of the earnest hope that it may meet with unqualified success in the attainment of all that it seeks to do for the men who compose it represents the heartfelt sentiment of our entire Brotherhood towards it.

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Brothers, remember the 40,000 men, women and children involved in the strike of the United Hatters of North America. The Hatters' Union is engaged in a life and death struggle in defense of the same principles that we are organized to uphold. If each member and friend of organized labor who can afford it will give them a little assistance in accordance with President Gompers' appeal, published elsewhere in this issue it will mean victory for them in their battle.

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New Union Label Trades Department.

At a recent conference of officers of the American Federation of Labor and representatives of various unions affiliated with the Federation which was held at the headquarters of the A. F. of L. in Washington, D. C., a union label trades department of the American Federation of labor was established.

In view of the almost inestimable importance of the union label—of the fact that it is the only sure and unmistakable evidence that the product bearing it has been manufactured by union labor—the step has been taken none too soon to establish this special department within the American Federation of Labor for the purpose of developing the more general use of the union label and the better impressing upon all the great necessity of demanding it when purchasing goods.

The business of the new department will be conducted by a permanent paid secretary, and its object as stated by its constitution is to promote a greater demand for products bearing the union label, and of labor performed by union workers; to investigate into, devise, recommend, and within the limit of its authority, carry into effect methods for the advertisement of union label products; to educate the members of trade unions, their families and the general public upon the economic, social, and moral uplift furthered by the trade union movement; to further the general welfare of all affiliated organizations, and to aid in the work of organization among all the toilers for the common good.

It is unnecessary to say that this new department will accomplish great good in the advancement of the cause of organized labor in general.

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IMPORTANT LABOR CONFERENCE AT WASHINGTON, D. C.

On February 10th last an important conference of labor leaders was held in Washington, D. C., upon the call of Hon. Oscar S. Straus, Secretary of Commerce and Labor. The object of the Conference, as stated by Secretary Straus, was to secure an interchange of ideas as to the future policies of the Bureau of Labor and the Bureau of Immigration, as it is recognized that both of these bureaus exert a very important influence for good or evil upon the interests of American wage-earners.

Those present at the conference held in Secretary Straus' office were Hon. Oscar S. Straus, Secretary of Commerce and Labor; Daniel J. Keefe, Commissioner-General of Immigration; Charles P. Neill, Commissioner of Labor; T. V. Powderly, Chief Division of Information; Samuel Gompers, President A. F. of L.; Frank Morrison, Secretary of the A. F. of L.; John Mitchell, member Executive Council, A. F. of L., New York, N. Y.; Jos. F. Valentine, member Executive Council, A. F. of L., Cincinnati, Ohio; W. G. Lee, Grand Master, Brotherhood of Railroad Trainmen, Cleveland, Ohio; Warren S. Stone, Grand Chief Engineer, B. of L. E., Cleveland, Ohio; W. S. Carter, International President, B. of L. F. and E., Peoria, Ill.; A. B. Garretson, President Order of Railway Conductors, Cedar Rapids, Iowa; Frank T. Hawley, International President Switchmen's Union, Buffalo, N. Y.; H. B. Perham, President Order of Railroad Telegraphers, St. Louis, Mo.; Wm. F. Yates, President Marine Engineers' Beneficial Association, New York, N. Y.; T. J. Dolan, General Secretary International Brotherhood of Steam Shovel and Dredgemen, Chicago, Ill.; Thos. F. Tracy, Vice-President Cigarmakers' International Union, Chicago, Ill.; Thos. Nolan, Fourth Vice-President International Brotherhood of Boilermakers and Iron Shipbuilders; Timothy Healy, President International Brotherhood of Stationary Firemen, New York, N. Y; P. J. Conlon, representing International Association of Machinists, Washington, D. C.; and J. D. S. Baird, President Order of Railroad Telegraphers, Dispatchers, Agents and Signalmen, Philadelphia, Pa.

Mrs. Georgia Ferguson, representative of a convention of unemployed just previously held in St. Louis, Mo., was the only lady in attendance.

Daniel Keefe, Commissioner-General of Immigration, stated the objects of the conference and announced that formal addresses would be delivered by Secretary Straus, Grand Chief Stone of the B. of L. E., Wm. F. Yates President of the Marine Engineers' Beneficial Association, President Samuel Gompers of the A. F. of L. and Terrence V. Powderly of the Immigration Bureau. Interesting speeches were made during the conference by the following gentlemen: T. J. Dolan, General Secretary I. A. of S. S. and D.; Timothy Healy, President I. B. of S. F.; John Mitchell, Second Vice-President of the A. F. of L.; Frank Morrison, Secretary of the A. F. of L.; Joseph F. Valentine, President I. M. U. of N. A.; A. B. Garretson, President O. R. C.; W. S. Carter, International President B. of L. F. and E.; Chas. P. Neill, Commissioner of Labor; Thos. Nolan, President B. M. and I. S. B. U. of N. A.; Henry B. Perham, President O. R. T., and Frank B. Hawley, International President S. U. of N. A.

Secretary Straus during his remarks said:

Gentlemen, I thank you for responding to the invitation that has been sent you for the purpose of giving me the benefit of your views and co-operation in connection with what I regard as some of the most important work intrusted for administration to this Department. The Department, as you know, is new; it is in a developing stage; and while I have been here I have been solicitous to direct its activities so as to perform in a practical way the varied and various governmental functions within its large scope.

One of the gentlemen, as he came in, humorously remarked, "Usually when we meet so many labor men together, the first question that is asked is, 'What is the trouble now?'" This gathering is unique. It is the first of its kind that has ever assembled in this Department. There is no trouble now for which this gathering has taken place. My idea, which has been expressed by Mr. Keefe, was to get the benefit of your wisdom, your experience, and by your co-operation to show how to eliminate and avoid much of the trouble that brings about many of the disturbances in the labor world.

Our purpose is constructive. A year ago, in furthering the scope of the Department, I called together the commercial interests of the country in a consultative way, just as you are here now, and representatives of some forty different commercial and industrial organizations assembled from as many cities of the country, and they subsequently formed the National Council of Commerce. The object I sought to attain, and which this organization, I think, will attain, was to bring about a co-operation between this and between the other departments of the Government having to do with commerce and the great commercial interests of the country—in other words, to get the benefit of the vast experience, the intimate knowledge, of the men engaged in the various industries, so that this Department, in moving forward for the extension of commerce, should have the help and advice of the commercial bodies of the country.

This is the Department of Commerce and Labor, and I am very desirous that we should have on the labor side that cooperation which you, gentlemen, who have devoted your lives for the benefit and uplift of the wage-earners, and who understand intimately their requirements and what can be done for their betterment, can give. This Department desires your co-operation in considering the problems that come within its scope; so that it can move, and, if you please, you can move, in co-operation, where it is possible—and it is very often possible—to come to an agreement as to the measures to be promoted.

. . . .

In my last annual report I have in outline proposed several measures, which are embodied in the paper that has been sent you in connection with the calling of this conference. Immigration, for instance, has always been—or at least during the last twenty years—a very important subject. It has been viewed by labor variously. There has been very much misinformation upon the subject; in fact, our statistics have been most misleading. They have been right substantally, and yet entirely wrong in the impression they convey. Under the immigration act of 1907 for the first time provision was made to obtain statistics of outgoing immigrants, returning immigrants, and we have derived a great deal of information from these figures. The past fiscal year has been abnormal—we must not be misled by that—but four or five months of the past fiscal year were entirely normal, and, judging from that as a basis, and from other data at our command, I feel entirely justified in saying that the immigration figures that have heretofore been given out by this Department, when judged in the light of the net addition to our population by immigration, have been 48 per cent. in excess of the *net* addition to our population by immigration. In other words, the returning immigrants, of whom we have taken no account heretofore, were 48 per cent. of the total of the incoming immigrants. That is to say, the net immigration is only 68 per cent. of the accepted immigration figures.

This leads up to this point, which is embodied in one of the questions here submitted: All agencies are at work in foreign countries—steamboat agencies, ticket agencies, and scores of other agencies—to induce emigration to this country. A great many immigrants, as a result of false, misleading, and intentionally wrong information, are induced to leave their homes and come over here, not knowing that while labor receives higher compensation here the standard of living is much higher. The laborer who succeeds in this country is more energetic in his work, he is more individualized, he develops a higher order of efficiency; the lazy, slothful man who can not succeed in his own country soon finds that lack of success is spelled in larger letters in this country. The class of immigrants to which I refer, who are beguiled to come, through ticket agents and others who are interested in transportation, when their eyes are opened—what is the result? Some remain here as pitiable jetsam, and others return to the country of their origin. Now, it has occurred to me that you could render a humane service and be of help to this Department if we could devise some plan by which a statement of labor conditions from time to time in this country could be drawn up in such a way as you all may agree upon, so that the truth might be known and the misleading and false information corrected and counteracted at its source, so as to reach the people who are by false information induced to move and come to this country, believing it to be the great El Dorado, where high wages await slothfulness. This is a subject for you to consider—what measures would best counteract the evil I have referred to.

I wish to lay before you a draft of a bill amending section 40 of the immigration law so as to enlarge the scope of the Division of Information, which more correctly should be styled "Division of Information and Distribution." The law as it stands was intended primarily for the distribution of immigrants, but it says "immigrants and others;" and I felt thoroughly justified in giving a broad interpretation to the word "others," for certainly we should always be willing to do for our native labor as much as we do for the immigrant labor, and I could not conceive that it could have been within the purview of the legislation not to carry out that point of view. The bill that has been drafted after careful consultation with Mr. Powderly, the head of the division, purposes to enlarge the scope of that section of the immigration law. This conference affords the occasion and opportunity of doing a far-reaching piece of work. And I must not conceal from you the fact that one of the main reasons I called this conference—which I hope will be but the beginning of such consultations, called either by the Department or asked for by you—was to lay before you the possibilities of this law, to have you consider it, and to see whether something practical and effective could not be done to meet to a large extent, so far as this country is concerned, the great problem of unemployment.

Our country is large; it has all climates; it has more diversified industries than any other, and so many forms of agriculture. Of course, in times of depression, such as we have had in the past year, the question of unemployment becomes more acute; but there is always before us the problem of unemployment. At certain seasons of the year most manufacturing plants slow down. Then some of the men are thrown out of employment—a certain percentage of them. I think there is nothing more detrimental to labor—even more detrimental in a way than the standard of wage—than this lack of steady employment. If we can do something to render some aid to the laboring man who is thrown out of his work through no fault of his, who is ready and willing to work—if we can help him to a job, I feel it is our duty to do it. It has appeared to me that a large percentage of this unemployment could be prevented if the information were daily accessible as to where and what kind of labor and at what wage rate and under what conditions it is in demand in every section of the country. The problem of unemployment, as I understand it—I speak before a body of experts and I am prepared to be corrected—affects more particularly the unskilled laborer. It affects the skilled laborer, but more generally, in numbers, the unskilled laborer.

Now, it so happens that when industries, say in the East, slow down there is a large demand for labor for limited periods in agriculture or in other industries in other parts of the country. Why can not that labor be supplied? There are two reasons. One is lack of information. The Division of Information can supply that, so that any man out of employment near Boston, or New York, or Chicago, can go to the Division of Information of this Department and find out where labor is in demand; and he can decide in what direction he wants to go and what occupation he desires to enter. But there is another obstacle, and that is the question of transportation. If, for instance, in the agricultural districts west of the Mississippi Valley there is a demand for the period of sixty or ninety days for agricultural laborers or labor for certain industries—a demand for a limited period—the question is always one of transportation—how can a man from the Atlantic seaboard go to the place where the labor is wanted, and then, of course, return when the employment is over, say, after three months or four months? It is an important problem. My idea of meeting that problem—and if it is properly presented it can be met—is this: I do not know, because I have not yet received an authentic decision, whether under the interstate commerce law the railroads can make what I choose to term a "labor-exchange" rate. I feel a certain degree of confidence that they would be inclined to make it in their own interest, because if, for instance, a harvest is to be gathered, or certain industries in the West, if you please, are unable to work their full shifts of hands because they can not get the labor, if that labor could be supplied from the East the amount of product would be increased and the increase of the amount of product would mean an increase of freight. In some countries the railroads find it to their interest at a very nominal sum to transport labor and again return that labor when it wishes to return.

These are questions that you probably have thought over. I may be in error in many of these suppositions that I lay before you; and before moving forward I consult you whether it meets with your approval; whether we can have your co-operation; whether you can aid us; and I propose to place before you a draft of an amendment of that section of the law to which I have referred, to enlarge the scope of the Division of Information, as a material aid in the solution of this great problem of unemployed.

Another question for consideration is that of the inspection of interstate locomotive boilers. We have in this Department a bureau called "The Steamboat-Inspection Service." The hulls of steamboats are inspected, and the boilers are inspected, and such inspection, it goes without saying, eliminates many accidents. The same kind of inspection that we do in connection with steamboat boilers we can do with locomotive boilers. I have had statistics—you railroad men know them better than I do—of the reported deaths that are annually caused by the explosion of locomotive boilers, and of the accidents occasioned thereby. I believe that whatever we can do to protect human life, within the scope of the governmental functions, we should do. I have made it my guiding principle in this Department, which is in many respects the most human of all the departments of the Government, that whenever the material interests conflict with the human interests I would be on the side of the human interests.

I remember when I came here and looked into the question of steamboat inspection I found they had only one inspection a year, and I determined that we should have four. Great opposition was met. Oh, it would delay commerce, it would impede, and it would be expensive. And I then determined that the material interests would have to accommodate themselves to the safeguarding of the millions of passengers who trust themselves on the steamships of the country, depending upon God and the Government.

President Gompers during the course of his speech declared that there were 2,000,000 (two million) workers out of employment. He read a summary of reports compiled especially for the occasion by various bodies of the industrial workers affiliated with the American Federation of Labor. This report showed that there were at that time no less than 15 per cent. of the workers out of employment, while in many of the principal lines of industry 40 to 50 per cent.

were all idle and had been for some months.

An interesting discussion then followed as to what the national government could best do to relieve the situation in such times of depression either by providing employment for men in some great public works or assisting those out of employment to reach sections of the country where work might be found. It was pointed out in this connection that the farmers of the Middle West felt the need of labor every year, being short of farm hands at a time when labor in many industrial sections was at its lowest ebb, and a great many workmen in these sections, consequently, out of employment.

Another point of discussion was the proposition to devise some effective means for counteracting the baneful influences of steamship agents and others who by misrepresentation and other unscrupulous tactics "reaching to positive knavery" induce herds of immigrants to cross the Atlantic to struggle for themselves and become a menace to the American workingman. It was shown that some of the favorite methods adopted by such steamship agents in carrying out this purpose are to paint glowing pictures of labor conditions and wages and wealth to be easily obtained in America, practicing all this deception for the sake of the agency commission they secure and the money that the steamship companies get for transporting the immigrants.

Another matter considered was the making effective of the "Foundation for Industrial Peace" the tribunal of arbitration which President Roosevelt founded and to which he donated the $40,000 Nobel Peace Prize awarded him for his conspicuous and successful efforts in bringing about the end of the Russo-Jananese war.

The following is the speech delivered on the occasion by our International President, Bro. W. S. Carter:

Mr. Secretary, Mr. Chairman, and gentlemen, in the beginning, I understand that the purpose of those people who advocated the creation of the position of Secretary of Labor, the occupant to be a member of the President's Cabinet, was to give the working people a chance to be heard where words counted for something. Instead of getting a position known as Secretary of Labor, to the office of which the working people could come, file their grievances and petitions for redress, we got what is known as the position of Secretary of Commerce and Labor. Fortunately, in selecting material for that position the President saw fit to select a man who recognized the fact that there was a labor end to his job as well as a commercial end.

Now, this meeting, I hope, is the beginning of a movement that will make it known to the working people of this country that the working people are going to be recognized and that attention will be paid to the stories they have to tell, of their conditions, of their hopes, and of their aspirations, as well as the attention given to the association of manufacturers, who seem to have access on all occasions and to all points.

We are here today to discuss special subjects. One of these subjects I know positively is discussed at an inopportune moment—a subject that to me, to Mr. Stone, and to the men we represent, is of paramount interest. It shows that, no matter where you go, there is a certain selfish instinct that causes a man to assign more importance to those things that will directly affect him than to those things that affect everybody. I mean that to us there is no question of so great importance as that of boiler inspection.

Unfortunately that question cannot be discussed at this meeting in a manner that will leave upon us the influence of what was said as strongly as if no other question had been discussed. In my observations I have noticed that some men in parliamentary bodies have the unhappy faculty of making a good motion at the wrong time, and it is generally "laid on the table." The reason of it is that the frame of mind of the convention at that time is not in a receptive mood for the subject that he wants to discuss. And I realize when I talk about boiler inspection that I am talking about something that directly interests none of you except Mr. Stone.

Mr. Stone and I represent about 126,000 men who are getting tired of seeing their associates killed and maimed by boilers that would not be permitted to be hauled as freight on a steamboat. A locomotive is probably constructed in its original form in as perfect a manner as it can be constructed, keeping within the price that the railroad company is willing to pay. When the Baldwin Locomotive Works sends out an engine it has a pride in the work that that locomotive will perform. The same might be said of the American Locomotive Works, in its various branches. Therefore we can safely say that, so far as the original construction of the engine is concerned, as a matter of business, the manufacturers will try at least to deliver as perfect a boiler as it is possible to do for the price that they receive for it.

Generally locomotives are ordered and put in service at a time when locomotives are badly needed, when even the passenger will discover a great congestion of traffic on every sidetrack by which he passes. When that locomotive arrives, in times like that, it may go out with a train without ever having been what we call "broke in." Ordinarily a crew would be called and they would go out and run up and down the road for a while and "break in" the engine.

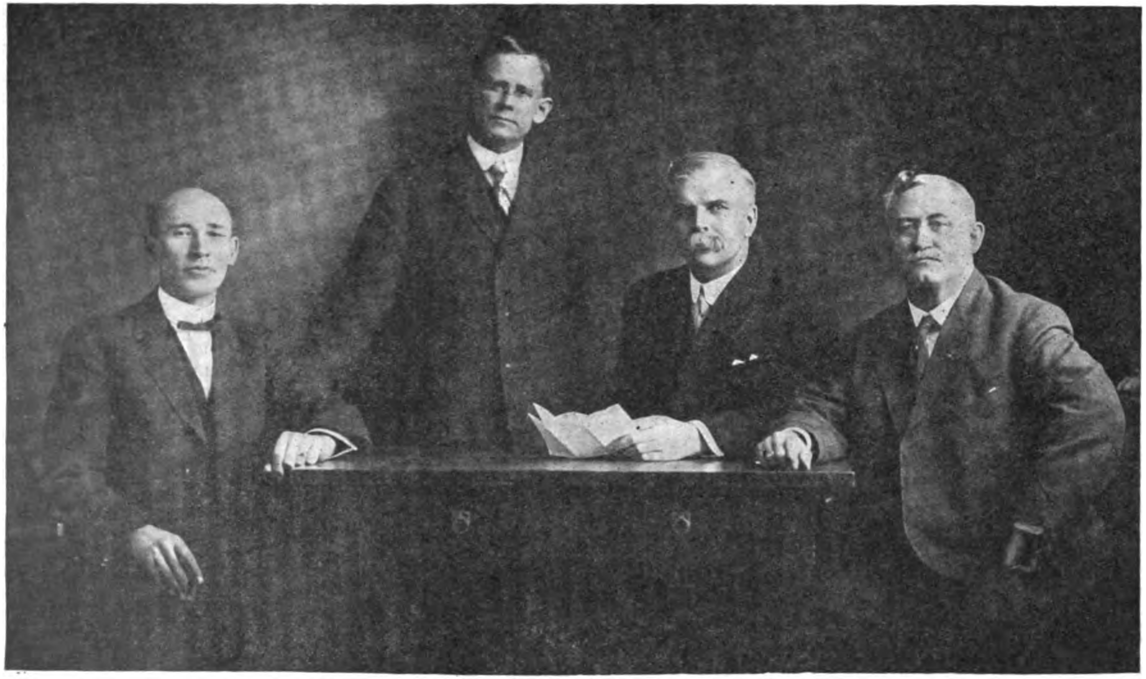
Since the coming of our recent period of prosperity, when an engine arrived it went right into service. The demand for that machine was so great that they had to abandon the old practice of every engineer and fireman "owning" his engine. We used to say "my engine," and we thought it was "my engine"—and it didn't make any difference so long as we thought it was. We took great pride in that engine. The engineer took great pleasure in taking time for which he was not paid in keeping up that engine. The fireman likewise would discuss "our engine," and there was nothing spoken of so affectionately as the "old 99." But the demand for locomotives was such that the companies discovered that they could get as much work out of one engine as two crews, or a crew and a half, were able to perform. So they placed the locomotives in what we call the "pool." From that day we have not "owned" any more engines. The engine is worked day and night in the "pool," and on many roads where business is good they don't catch the same engine twice in a long while.

When engines are worked at the height of their capacity, beyond the endurance of engine crews, it means that there is no time to repair boilers and to do the work that should be done. Today the engineer comes in and he reports on the roundhouse book certain work—I beg pardon, I do not mean today; I am talking about during the days of prosperity. A train crew comes in, and the engineer records certain work to be done. Now, it means that that work can not be done if that engine has to go out—and the yardmaster has reported to the roundhouse foreman that "there has been a string of cars waiting up there since 10 o'clock in the morning for an engine." The engine goes out, it comes back, and it goes out again; and if the engine holds together long enough nobody is killed.

Many years ago the hollow staybolt was invented. The purpose of the hollow staybolt was to tell when a staybolt was broken. Hollow staybolts are not as popular as they were, because they do tell when staybolts are broken. A staybolt that is not hollow and will not let the steam escape on the outside or the inside, to give an alarm of the danger, is expensive, more expensive than a staybolt that can break without giving you the alarm, which will result in repairs.

Prosperity passes. The time has come now when engines can be repaired. The first to know that prosperity is over is the traffic department of the railway company. That traffic department has a telephone connecting with the office of the operating department, and before you know it, and before anybody else knows it, before the farmer or the merchant knows it, the railway company has decided to curtail expenses, and, as was said by Mr. Stone yesterday, their shop force is the first to feel it. I want to say that the track force also feels it. The very force, the very character of men, that would be maintained if the safety of human lives was to be considered, are the very first to go. The track may get crooked, it may go down, but the trackmen go. The engines may become defective, but the shopmen go. When there is time for the locomotive to be repaired there is no man to do it.

I do not want to reflect either on the inspector, or upon this Department, or upon any other department of the Government, because I know that the gentlemen at the heads of these departments are men of integrity, men who do the best they can; but I believe it is a mistaken idea on their part when they assume that the statistics they furnish are final. They furnish statistics based upon matter that they believe to be accurate; they are honest. But we at the other end do not have much faith in these statistics. There is a map [indicating]. If you will glance from Nogales on the west to Brownsville on the southeast you will find a stretch of country of nearly 1,500 miles, if you take into consideration the meanderings of the Rio Grande River, over which thousands and



W. S. Carter, President
Brotherhood of Locomotive
Firemen and Enginemen

W. S. Stone, Grand Chief Engineer
Brotherhood of Locomotive
Engineers

A. B. Garretson, President
Order of Railway
Conductors

W. G. Lee, Grand Master
Brotherhood of Railroad
Trainmen

EXECUTIVE HEADS OF FOUR GREAT RAILROAD ORDERS thousands of immigrants come every sheep-shearing time. They do not bring many clothes. They wear sandals, with rawhide strings between their toes to hold the soles on their feet. These men come by contract made the year before, to come back and shear those sheep, and you haven't one of them recorded in your immigration statistics. If you will ride on a train on the Southern Pacific road or on horseback, as I have done in the Rio Grande country, you will find that, like the ducks and the geese, which foretell the coming of winter, the Mexicans give warning that sheep-shearing time has come. They come—a great inundation of labor. They come and scatter themselves over 1,200 miles of sheep country. They are under contract entered into between themselves and their employers the previous year, and they come in and shear those sheep. They get the money for it—pitiful as the sum may be—and, like the migratory birds, they fly back.

Now, I am going to another point—the statistics of the Interstate Commerce Commission—and I want to say to you that I am a friend of the Interstate Commerce Commission, because I think they are friendly to us. They show that during the years from August, 1903, to December, 1908, which you quoted here, and which is a period of over five years, only 265 men were killed in all walks of life through boiler explosions. Boiler explosions killed 25 of our men in 1907; and the reason I know it is that I paid the bills—I paid the insurance of them. Mr. Stone will tell you that his experience is the same. If Mr. Stone's organization and my own together paid 61 death claims in one year because of boiler explosions, 265 killed in all walks of life in more than five years seems below what it should be to me. I am not casting any reflections on the statistics of the Interstate Commerce Commission, for this reason: The railroad companies make certain reports to the Interstate Commerce Commission, and the law contemplates that the railroad companies will not prevaricate. The Interstate Commerce Commission bases its figures on what the railroad companies tell the Interstate Commerce Commission.

I have cited to you two instances, Mr. Secretary, one where your Department cannot find those Mexicans who come over by the thousands every year, shearing our sheep, and getting the benefit of the tariff on wool, and going back and spending our money. You have no practicable way of doing it unless you string the men out a hundred yards apart, because those Mexicans are shrewd enough to avoid your riders on the Rio Grande River, which at about sheep-shearing time is so low that they can wade it in many places.

If any way can be devised whereby we can extend the same protection to the lives of the men who run the engines and the lives of the people who ride behind the engines that is now extended to those people who ride on steamboats, it will be a blessing to all of us and will increase our mortuary fund about $35,000 a year. I am in hearty accord with that part of this program, because it appeals directly to the interests of the men that Mr. Stone and I represent. I am not here to say how it should be done, because I will confess to you that I am ignorant about how legislation should be drafted or how it should be enacted. I believe that the gentlemen who have promoted this movement—among others, Mr. Secretary—will do all they can to bring about so desirable an end.

There is nothing that is so alarming, and yet so unnoticed, as lack of inspection of locomotive boilers, unless it is one point that I am going to refer to that is entirely foreign to this question, and which Congress and the people of the United States, in their paternal spirit, have overlooked—and that is that locomotive cabs have gotten so wide that it is almost impossible to stick your head out of a cab window and comply with the rules of the company without getting your head knocked off. In the four years 1904 to 1907, we paid 43 death claims because of firemen and those who were running engines, who were members of our organization, who tried to comply with the rules of the company and watch out for signals. It is said that engineers are not struck by objects too near the tracks as often as firemen. That can be easily understood, for this reason: It is the engineer's duty to sit and watch ahead. His eyes are accustomed to the degree of light. The fireman's duty is supposed to be on the deck, and if he is not there, why, you don't go very fast. He is firing an engine and he is heaving in coal; and anyone who never saw the intensity of the light in a firebox when being worked to its highest capacity can not realize what an intense light it is.

In the meantime he is rounding curves; he is approaching terminals where the semaphores and switch targets are coming into sight; and he has to watch out for signals. And if anything happens, if a wreck occurs, and it can be shown that the signal was on his side, why, he is discharged for not watching out for the signal. If he gets up from the deck to his seat in his half-blinded state and tries to look out for a signal, then maybe a post comes along and knocks his head off. When that post was set there probably it would not knock off his head for the reason that the cabs were nearly two feet narrower then than they are today.

The railroad companies have solved the problem of transportation largely by increasing the size of their engines. An engine today will pull two, or three, or four times the tonnage that the old ones did. These cabs have increased in width until now the engineer has to shout at the fireman to make himself heard. In the old days they used to hand tobacco across the cab. Those sides of these cabs have gotten so near the bridges—the old iron bridges are too expensive to discard—that the engineer pulls his head in and allows the iron to pass the cab. If the fireman, half blinded, almost exhausted, gets upon the seatbox and puts his head out for a breath of air, he is killed. The mail cars have not increased in width as have the engine cabs. The mail cranes are set to suit the width of the mail car, and not of the engine cab; and I am told that there are places on some roads where the mail cranes miss the cab only 1⅞ inches—just a clearance. Yet a man is supposed to look out for signals. I did not bring up this question to divert the discussion from the subjects named; but I want to show you that if given an opportunity the Secretary of Commerce and Labor would hear a wonderful lot of things that he never heard before. And I think that is the purpose of the gentlemen here, when they deviate from the subject and talk of things that it is in their hearts to talk of.

And now I want to speak about the question of the Division of Information. Railroad men, I believe it can be truly said, suffer less from immigration than any other class of men on earth. In fact, they have been thrown together so much on their trains and segregated from other labor so much that they have been accused of lack of sympathy with other trades. If there be a lack of sympathy, it is simply because it is a creation of environment; it is not because there is any inherent lack of sympathy in the heart of a railroad man. When we come here and listen to what these gentlemen talk, I want to say we are so sympathetic that we won't dodge the question a bit. We will say that the Division of Information ought to be done away with, and I will tell you why I say so, although it does not cost us a cent; it does not cost us perhaps a job. It may be immigrants, by crowding the men on the streets that work at other trades, may force others to crowd us off the precipice; but so far as immigrants taking our positions, we are not afflicted with that. We have the German people of Pennsylvania, but they were born in Pennsylvania, and perhaps their fathers were born in Pennsylvania. You go to the Northwest and we have many Swedes, but generally they were born in that country. Therefore, we do not come into direct conflict with the new-coming immigrant.

A few years ago there was a strike at Denver, and that strike did not concern us directly. It was a strike of the trainmen's organization. A telegram came to our office saying that the company was hiring Japanese brakemen. We simply stated to the company: "Japanese brakemen do not go with us. If you get those men we are going to make an issue right there." And that is the only reason in the world that the Japs are not running the engines and trains, because we have yet retained the power to prevent it. If ever the pressure gets so great that our power is overcome, then you will have the Japanese on the engines, because the company likes them. They use them in their roundhouses, in the extreme West, and they are using them almost entirely in their track work, and they are displacing American labor in the section of the country from which Mr. Valentine comes. You go into a hotel in the Northwest, and you will find every man there, except the clerk, is a Jap. Go into the yards, and you will see a Swede boss and a half-dozen Japanese workmen. That Swede was born there; he is a native, but the Jap is not and he doesn't want to be.

I believe that the value of this Division of Information depends entirely upon the character of the information it furnishes. If it can so manage to convince the people of Europe to stay at home, it is the best thing we have got. But presumably it will tell the truth.

Concerning this Division of Information—and I want to say that as good a friend as I ever had, and a man whom I have always liked, Terry Powderly, is at its head—if there is anything I can do to help that division, I will do it, because of my feeling for the man who is handling that part of the work.

But here is information being furnished abroad. We furnish information that will discourage immigrants coming here only at a time like this. The Secretary has told you that in these hard times they go back home, and that I think is the best news that we have heard here. If that 48 per cent. had not gone back last year, God help us! The most hopeful feature is the fact that they can go back. If the other two million who are supposed to be out of employment would go back, the immigration question would largely settle itself.

But here is information furnished by this Department, and that information will tell (even when the truth is told to the people of Europe) that the conditions in this country are so far better than the conditions in any other country that it will induce immigration while we want to reduce immigration. I am going to say something that, perhaps, may be classed as a vulgar illustration. Did you ever see a hen and chickens in the yard, and when the hen found something good to eat how she would cluck and cackle and how the little chickens would run? That hen was disseminating information that there was "something doing." And did you ever see your neighbor's chickens fly over the yard fence at that hen's cluck and eat all the worms that your chickens were supposed to eat? Now, I do not want my friend, Mr. Powderly, when he scratches around and finds a good, plump worm, to go to clucking and have our neighbors' chickens fly over here and eat our worms.

This is how the immigration question appeals to us railroad men. Not because we have selfish interests; but notwithstanding the fact that we are supposed not to have any interest. I want to say to you that the railroad men of this country have as great a regard for the welfare of the working masses as any other men on earth. Our business calls us in lines of employment where we do not meet you; we do not have the privilege of assembling many times in your halls; but I want to say to you that at any time when you need assistance and we believe the assistance is due you I do not believe you will ever find a railroad man refusing to respond.

SECRETARY STRAUS: For the information of all here, upon the very subject that the last speaker was discussing, may I just read a brief extract from my annual report bearing upon this subject which induced its consideration here? I think it will clarify it a little. In my annual report, under the head of the "Problem of the Unemployed," referring especially to this Division of Information, I said this:

The scope of this division would be usefully extended in another direction, which I have embodied in the recommendation for the amendment of the law proposed by the division. The immigration figures to which I have referred afford evidence that much of the immigraton to this country is stimulated by false, glowing, and misleading information in regard to the opportunities here, as if the country were an El Dorado where laziness is rewarded and large returns await even the slothful. When such immigrants come they find that while the rewards of labor are much greater in this country than in their own the American laborer is more industrious, energetic, and self-reliant than elsewhere, and that while the opportunities in this country are greater the qualities necessary to benefit thereby also require an increase of effective energy, and that the same lack of qualifications which spelled failure at home are writ even larger in this country. With their delusions dispelled they return to their countries sadder but wiser men.

Much of this kind of immigration could be stopped at its source by the dissemination of correct information throughout foreign countries from which our immigration chiefly comes. Perhaps the best medium through which this information could be disseminated from time to time is through our consuls; also the various labor organizations of the country could be of aid to the division, both in the collection and presentation of the various kinds of information referred to. I foresee great and substantial extension that can be given to the scope and work of this important division, and trust that Congress will enable the Department to carry forward this work in the various directions I have outlined.

Having in view the importance of the subject and the many-sidedness of it, I thought it best to refer the whole subject to just such a conference as we have here.

(Mr. Keefe called on Doctor Neill, Commissioner of Labor, asking him to make a statement relative to his investigation of the purpose of the Round Oak Stove Company, Dowagiac, Mich., in communicating with the New York office of the Division of Information about September, 1908, as Mr. Valentine, president of the Molders' Union of North America, stated that he (Mr. Valentine) had been informed from various sources that the Division of Information had advised workmen to go to Dowagiac, where they were to be employed by the Round Oak Stove Company to learn the molding trade.)

This is the first conference of its kind that has ever been held in the United States and it constitutes a precedent of the greatest importance to American workingmen. While it was entirely informal it was profitably deliberative—the representatives of labor engaging freely in the discussion of all subjects considered.

It is expected that this conference will lead to a systematic and intelligent co-operation between the agencies of the government and organized labor in the better protecting the interests of American toilers and incidentally regulating immigration and putting a permanent stop to the gross deception being at present practiced on the unfortunate peasantry of European countries in inducing them to spend their little hard-earned savings for the purpose of providing business for the steamship companies.

In Germany there is an Advisory Council, and in Austria a Labor Council, and in France a Supreme Council of Labor to co-operate with the Government in looking after the welfare of the toilers of those nations, and it is hoped that a similar body will be permanently established in the United States as a result of the conference called by Secretary Straus.

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President Gompers' appeal in behalf of the United Hatters of North America, appearing elsewhere in this issue, should be heeded by every member and friend of organized labor.

Mr. Rockefeller, it is said, has returned from the South much improved in health and vigor, but with his view in no sense changed as to when he will pay that $29,000,000 fine imposed by Judge Landis as punishment for Standard Oil Company violations.

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Increase of Percentage of Power-Braked Cars in Train.

At a general session of the Interstate Commerce Commission held at its office in Washington, D. C., on March 8th last the following action was taken in the matter of percentage of power-braked cars:

WHEREAS, By section 2 of the act of Congress approved March 2, 1903, amending the Federal Safety Appliance Act, it is provided that "to more fully carry into effect the objects of said act the Interstate Commerce Commission may from time to time, after full bearing, increase the minimum percentage of cars in any train required to be operated with power or train brakes which must have their brakes used and operated as aforesaid;" and a sufficient time appears to have elapsed since the Commission's order of November 15, 1905, became effective to permit the carriers to provide for any necessary increase of such minimum percentage; and,

WHEREAS, The Commission has set for hearing on May 5, 1909, the matter of increasing the present minimum percentage of power-braked cars which shall be used and operated, if such an increase shall appear justified by the statements and testimony presented;

It is ordered, That all common carriers subject to the Safety Appliance Act, as amended, be, and they severally are hereby, required to report to the Commission on or before the 1st day of May, 1909:

(1) The number of freight cars owned.

(2) The number of such cars equipped with air brakes; and

(3) The average percentage of air-braked cars used in trains during the six months prior to March 1, 1909, together with a statement of any instruc-

tions issued by the carrier respecting the use of air on its line.

EDW. A. MOSELEY,
Secretary.

* * *

To the Men and Women of Labor.

To the men and women of labor, to all our people, we appeal to their sympathy, their judgment, and their patriotism to see to it that the Hatters and their families may be provided with at least such essentials of food, in order that their rights, their interests, their character, and their lives may be maintained, and that hunger shall not be the successful lash of the greedy employer to force the workers into abject submission.

The foregoing from an appeal by President Samuel Gompers of the American Federation of Labor, clearly represents the condition of the 40,000 men, women and children who are involved in the awful struggle in which the United Hatters of North America are now so bravely engaged in defense of their union label. We cannot too earnestly impress upon our readers all that is at stake for the organized labor movement in this fight.

President Gompers' appeal in full is as follows:

"*To All Organized Labor and Friends, Greeting*:

"The Executive Council of the American Federation of Labor has done and proposes to do all in its power to help the thousands of men and women engaged in the great defensive contest in the hatters' trade to victory. Owing to the hostile action of the Hat Manufacturers' Association, there are less than 1,000 men and women employed under union conditions. They have assessed themselves twenty-five per cent. of their earnings, but it cannot be expected that they can support fully forty thousand men, women and children. The hosts of labor and our friends must come to the rescue and help defeat the attempt of rapacious and tyrannical employers to subjugate and break the spirit of the workers and force them down into a condition of serfdom.

"The Union Label Trades Department of the American Federation of Labor has just been formed in Washington. It unanimously adopted the following declaration and appeal:

" 'Ten thousand hatters and five thousand hat trimmers have been on strike the past twelve weeks. There are, therefore, forty thousand men, women and children involved. The hatters have been and are made the target of the concentrated attack not only of the hat manufacturers, but of the Van Cleave National Association of Manufacturers. In the first instance the suits at law brought against the United Hatters of North America for $340,000, and now the conspiracy and attack upon their union label. The plain purpose of the attack of the hat manufacturers upon the hatters' union label is of greater significance than appears upon the surface. It not only aims to destroy the union label, to establish the open shop, but the non-union shop with reduced wages, longer hours, and the imposition of intolerable conditions in its wake.

THE UNITED HATTERS OF NORTH AMERICA
UNION MADE
REGISTERED

Buy no Hats that have not got this Label in them

" 'We, the representatives of international unions issuing union labels, in convention assembled, recognize the attack of the hat manufacturers' organization as not only an attack upon the organized effort of the hatters, but as a blow aimed at the very heart of the organized labor movement of our country. The Hatters are therefore engaged in a bitter contest against a conspiracy of conscienceless, rapacious employers.

" 'We recognize the struggling hatters in this contest as the vanguard in the battle waged against the rights and interests, not only of themselves, but of all the toiling masses. Therefore, quite apart from our natural and fraternal sympathy with the hatters in their great contest, their cause, their success, must of necessity be the cause, the success, the impulse the purpose, and the aspirations for an American standard of life for the workers of our country, and that it is the bounden duty of every worker, organized or unorganized, the duty of all liberty-loving people who hope to maintain the standard of character, the independence, and self-respect of the toilers of our country, to render every possible asistance that greed, chicanery and tyranny may be thwarted, and the sturdy character of America's yeomanry maintained. We therefore urgently request:

" '*First. That every wage-earner, organized and unorganized, contribute the sum of 10 cents on Saturday, May 15th.*

" 'Second. That a similar contribution of 10 cents be made on the Saturday nearest the middle of each succeeding month so long as the contest shall continue:

" 'Third. That we urge upon sympathetic and liberty-loving Americans the contribution of food products.

" 'Fourth. That the organized workers pay these voluntary 10-cent contributions to the secretaries of their respective local organizations.

" 'Fifth. That the secretaries in turn transmit the amounts to the Secretary of the United Hatters of North America, Martin Lawlor, 11 Waverly Place, New York, N. Y.

" 'Sixth. That we urge all international unions who can do so, to contribute immediately from their funds to the support of the hatters in anticipation of the contributions of their respective memberships, and in that event local unions of such internationals are urged to send their contributions to their respective international unions.

" 'Seventh. That the officers of international unions be urged to issue special appeals to their respective locals with a view of enlisting the sympathetic and prompt co-operation in carrying out the purpose of this appeal.

" 'Eighth. That all friends and sympathizers contributing moneys or food products direct them to Martin Lawlor, 11 Waverly Place, New York, N. Y.

" 'Ninth. That all city central bodies be urged to aid in carrying into its fullest effect the purpose of this appeal and to select committees to secure contributions of funds and food products.

" 'Tenth. We recommend to the struggling hatters that the payment of stipulated sums as strike benefit be suspended during this contest, and that instead food store houses be established in the centers where the men, women and children are located, and that funds and food be furnished to the families of the struggling hatters in proportion to their families' necessities.

" 'To the men and women of labor, to all our people, we appeal to their sympathy, their judgment, and their patriotism to see to it that the Hatters and their families may be provided with at least such essentials of food, in order that their rights, their interests, their character, and their lives may be maintained, and that hunger shall not be the successful lash of the greedy employer to force the workers into abject submission.'

"The Executive Council of the American Federation of Labor heartily adopts this appeal and urges upon all national, international and local unions, central bodies, as well as friends and sympathizers, to promptly and enthusiastically enter into the duty of contributing to the struggling hatters' support and thereby make the hatters' victory an assured fact,

"Send all contributions of funds or food to Martin Lawlor, 11 Waverly Place, New York, N. Y., and notify the President of the American Federation of Labor thereof.

"Yours sincerely, urgently and fraternally,

"SAMUEL GOMPERS, President.

"Attest:

"FRANK MORRISON, Secretary."

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The True Conditions in Seattle.

To Whom It May Concern:

Owing to the many letters which a certain brother in Seattle, Wash., has received making inquiries as to the conditions in the West and the prospects for working in connection with the Alaska-Yukon-Pacific Exposition in order to pay expenses while visiting that great event, he desires that the following letter be published in the Magazine:

"I get so many communications from brothers looking for work that I deem it necessary to advise the brothers through the columns of the Magazine in regard to the true conditions here in Seattle. There is plenty of work; in fact there is quite a great deal of work going on, but there is also an abundance of men to carry on that work. I do not doubt but what there will be plenty of advertising going on to induce men to come here on account of the A. Y. P. Exposition, but, brothers, don't allow this advertising to bring you out here expecting to get work and thinking it would be a good chance to take in the fair, for if you do, some of you will be sadly disappointed."

* * *

Remember the striking Hatters are no longer drawing strike benefits. Read Brother Gompers' appeal in their behalf in this issue and give them what assistance you can.

* * *

*Leaders Wanted.**

It is said that every soldier in Napoleon's army carried a marshal's baton in his knapsack. This statement may be an exaggeration, but it is a suggestion which may well become an inspiration to every worker.

I have no sympathy with the idea that the workingman must of necessity always remain in the position which he now occupies. Of course, it is true that most workingmen have come to the conclusion that they will always work for wages, and that whatever reward comes to them must come in that form. But even if that is true, it does not follow that there is nothing better ahead. To be satisfied with one's position in life, with no ambition to advance, is the blight which curses many a toiler. "Meat, Malt and Mattress" seems to be the motto of many a workingman.

I can hear the professional agitator or even the humble worker himself insist that it is impossible to advance under the present social system. I think that I know something about this and other difficulties that stand in the way of progress. The present social system is not ideal, but if one is to wait until we reach the millennium before seeking better conditions, the millennium will never come. The millennium will be ushered in very largely because some enthusiastic individuals forged ahead in spite of every obstacle, carrying with them even those who were dismally howling that the thing could not be done.

Something like four hundred years ago a man became convinced that there was undiscovered land beyond the bounds of his country, although they had erected a monument on the shore and stamped their coins with a motto which indicated that their country was the end of the earth. But Columbus found upon the shore strange things which must have come from an unfamiliar land. In spite of the ridicule of scientists, philosophers and nearly everybody else that was supposed to amount to anything in those days, he began his search for the unknown shore, and the result is America.

There is many an apprentice in the shop and many a journeyman, too, who may become a Columbus, Not alone may he carve out for himself a name that will bring honor and fame, but in advancing himself he may prepare the way for those who are bound to him by the ties of brotherhood. For the best type of manhood is not that which seeks power for power's sake, but that which uses it for the good of others.

There is no greater field today for the exercise of real talent than in the labor movement. There are few men outside the movement who can ever become the leaders of labor. They may study out for us the significance of certain phenomena and offer suggestions which may be helpful, but the actual leaders must come from the people. The workingman who has a vision of what his people are, and, principally, what his people may become, has a future which no one can take from him, for neither capitalist nor social system nor prejudice nor power of any other kind can deny him the right to win and lead to better things those who believe in him.

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*By the Rev. Charles Stelzle.

THE FEDERAL GOVERNMENT AND THE RAILROADS

BY W. P. BORLAND

Theories Must Give Way to Facts.

Statute law is but the expression of a public need, the crystallization of a public sentiment. An abstract theory of government may be magnificent in its ideals; it may furnish splendid inspiration for patriotic teaching and campaign oratory, but whenever its application fails to meet the needs of economic development it must stand aside or submit to such modification as the situation demands. Society is not seeking methods in government; it wants results. Government is established for the attainment of a purpose, not for the exploitation of theories, and the sentiment which demands a certain method in government at the expense of the ends to which the government itself is devoted is neither sensible nor logical.

Could the framers of our federal constitution behold the extent to which the general government has invaded fields of legislation which, until quite recently, have always been regarded as the peculiar function of the States they would stand aghast. This extension of the federal power is a very patent illustration of the truth that theories must always give way to facts. Whatever ideals of national polity society may subscribe to, its actual form of government will always be determined by the social and economic needs of the governing body. By the governing body I mean the body which actually elects the executive and the legislature; and elects, appoints, or dictates the appointment of judges. In the United States that is supposed to mean the whole people. In monarchical countries it means the restricted governing class. Industrial development in the United States has been such as to greatly magnify our national interests and emphasize our common citizenship. It thus happens that problems are constantly arising which the federal legislature alone can deal with in a manner completely to satisfy public demands.

The main sanction for federal regulation is found in the commerce and post roads clause of the constitution, and such regulation has naturally been co-extensive with the development of our magnificent railroad system of interestate transportation. The first direct recognition of railroad companies as federal agencies in the conduct of interestate traffic grew out of an experience in the Civil War, and led to the passage by Congress, in 1866, of an act which has been called "the charter of the American railroad system." This act authorized any railroad company in the United States, operating a road by steam, to transport passengers and freight from one State to another and to receive compensation therefor, and to connect with roads of other States so as to form continuous lines for the transportation of same to the place of destination. It was introduced by Senator Sumner and was vigorously championed by him in three sessions of Congress before its pasasge was secured; it was, in fact, the most important matter before Congress at that period, with the exception of the reconstruction measures.

The passage of this act was urged to correct an interference with interstate commerce which had arisen through the action of the State of New Jersey in granting a monopoly for the transportation of passengers and property between the cities of New York and Philadelphia, across the State of New Jersey, to the Camden and Amboy Railroad Company. One of the provisions of the charter under which this road operated was that in lieu of all other taxation the road should pay to the State of New Jersey a tax of ten cents for every passenger carried over its line between the cities of New York and Philadelphia; and all other railroads were forbidden to enter into competition with the Camden and Amboy Railroad for the transportation of passengers and property across the State of New Jersey between the cities of New York and Philadelphia. During the war the national government, in the transportation of troops and supplies for the maintenance of its armies, was unable to secure adequate transportation facilities from the Camden and Amboy Railroad, and in this emergency pressed the Raritan and Delaware Bay Railroad into its service for the transportation of a number of troops and a quantity of quartermaster's stores from New York to Philadelphia. Under the terms of its charter the Camden and Amboy Railroad Company filed a bill in equity praying that the Raritan and Delaware Bay Railroad Company be compelled to desist and refrain from such transportation and that an account be taken to ascertain the amount of damages. The New Jersey courts upheld the claims of the Camden and Amboy Company and compelled the Raritan and Delaware Bay Railroad to pay over to it the amount which had been received from the general government for the transportation of the troops and property referred to.

In the debates on this bill Senator Sumner contended for the right of the national government to establish roads within the States on three separate grounds:

First, under the power to regulate commerce among the several States.

Second, under the power to establish post roads, and

Third, under the power to raise and support armies.

Opposition to the bill was both vigorous and able, Senator Morrill, of Maine, being one of its principal opponents. The grounds of opposition were that such a law would give the federal government the right to charter railroads in any of the States without their consent, and that it might even lead to the unthinkable result of federal regulation of railroad rates. It was also urged that the law would have the effect to repeal or nullify the terms of the charters granted by the States.

The bill finally passed with the following amendment to its first section:

"Nor shall it be construed to authorize any railroad company to build any new road or connection with any other road without authority from the State in which such railroad or connection may be proposed."

This amendment was accepted by the supporters of the bill in order to remove opposition and insure its passage, but it was insisted by Senator Sumner and other supporters that the amendment was not at all necessary to make the statute conform with the constitution; it was accepted merely to allay the feeling of opposition to the measure on the part of the defenders of the authority of the States.

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Contributed

Decrease in the Percentage of Employes Killed.

To the Editor of Locomotive Firemen and Enginemen's Magazine:

Dear Sir—Will you permit me to call attention to the misleading nature of the column of percentages of "Employes killed" in the table incorporated in a "Contributor's" article on "Compensation for the Judicially Disinherited" in your March issue?

According to this table the percentage of employes killed would appear to be increasing at an alarming rate, being given as 8.55% in 1907 against 3.90% in 1888. The error, if such it can be termed, is due to "Contributor's" calculating the ratio of fatalities each year to the total for twenty years *irrespective of the increase in number of employes.*

When this potential factor is taken into account, students of the subject arrive at the more encouraging conditions set forth in the following statement of the number and percentages of fatalities to employes in railway accidents from 1888 to 1908:

Summary of Fatalities to Railway Employes and Percentage to Number Employed, 1888 to 1908.

Year Ending June 30.	Number of Employes.	Number Killed.	Correct percentage.	Misleading percentage.
1908.....	1,451,000	3,358	.231	8.55
1907.....	1,672,074	4,534	.271	7.41
1906.....	1,521,355	3,929	.258	7.41
1905.....	1,382,196	3,361	.243	6.34
1904.....	1,296,121	3,632	.280	6.85
1903.....	1,312,537	3,606	.274	6.80
1902.....	1,189,315	2,969	.250	5.60
1901.....	1,071,169	2,675	.250	5.04
1900.....	1,017,653	2,550	.249	4.81
1899.....	928,924	2,210	.238	4.16
1898.....	874,558	1,958	.224	3.69
1897.....	823,476	1,693	.205	3.19
1896.....	826,620	1,861	.225	3.51
1895	785,034	1,811	.232	3.41
1894.....	779,608	1,823	.234	3.44
1893.....	873,602	2,727	.312	5.14
1892.....	821,415	2,554	.310	4.81
1891.....	784,285	2,660	.339	5.01
1890.....	749,301	2,451	.327	4.62
1889.....	704,743	1,972	.279	3.72
1888	652,500	2,070	.317	3.90

The most cursory analysis of this statement shows that there has been a gratifying decrease in the average fatalities to railway employes. The death toll of this great industry is still deplorably heavy, but a comparison of the percentages for the six years, 1888 to 1893, with the six years, 1903 to 1908, shows that the average percentage of fatalities to those employed has fallen from .314 to .259, a decrease of 21%, or more than one-fifth.

Interpreted into absolute figures this means that there were 1,096 less fatalities to employes in 1908 than if the average ratio of the first six years of the above statement had prevailed.

HOW THE PANIC DECREASED FATALITIES TO EMPLOYES.

In order to realize the good that came from the ill wind of adversity that struck the railways in October, 1907, it is necessary to compare the fatalities to employes for the years ending September 30, 1907, and 1908, as given in the quarterly Bulletin of Accidents, as follows:

Period Three Months to	FATALITIES TO EMPLOYES.	
	Year Ending Sept. 30, 1907.	Year Ending Sept. 30, 1908.
December 31	1,430	1,011
March 31..............	1,293	656
June 30...............	954	534
September 30..........	1,144	624
Total 12 months....	4,821	2,825

From this it appears that where the number of employes decreased about 13% as shown in the preceding table, the fatalities to employes decreased over 41%.

A further analysis shows that the percentage of fatalities to employes during the year ending September 30, 1908, is only .194%, or considerably below the low water mark in the table, which naturally occurred in the period of depression that followed the panic of 1893.

It seems to me that all of us who are directly interested in railway affairs should welcome the fact that the hard times from which the railways were the chief sufferers were attended with a recession in the number of fatalities in railway service three times greater than the recession in business or employment.

Yours very truly,

SLASON THOMPSON.

Flooding the Railroad Labor Market—Greed Marshaling Its Forces.

> **MEN wanted, good vision, under 30, over 145 pounds, for brakemen and firemen on railroads in this vicinity; experience unnecessary; pay $75 to $100 monthly; promoted to conductor or engineer, $150 to $200 monthly; state age, weight, height. Address T 32, Office of The Post. cs33-37to-9n**

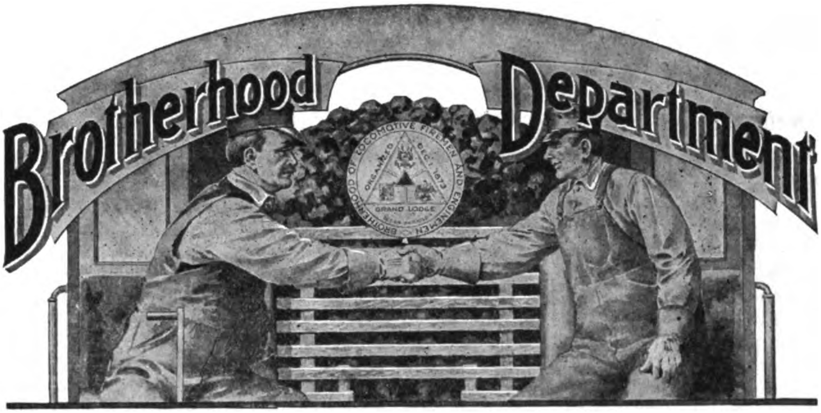
> **YOUNG MEN for railroad firemen, brakemen, baggagemen, $75-$100 to start; early promotion; experience unnecessary; state age, weight and height. Address Railway Bureau, 348 Panama Bldg., St. Louis, Mo. cp33-214teo-9**

The foregoing ads appeared in the Sunday Pittsburg Post of March 14th. Their misleading character is apparent to all railroad men at a glance. That they are intended to deceive the unwary is evident to all who have any knowledge of railway employment conditions. These ads and others of a similar nature have appeared in the Pittsburg papers from time to time for the past six months. They are wholly and absolutely unwarranted by conditions prevailing in railway circles in Pittsburg and within a radius of two hundred miles therefrom. Within the past year at least five hundred experienced firemen have been temporarily laid off on account of slack business on the various divisions of railroads in the territory above referred to; again, no fireman, brakeman, engineer or conductor makes anywhere near the monthly wages represented or rather misrepresented by the above ads. The very best paid men are the passenger engineers, who do not make $150 per month, and the $200 per month rate quoted exists only as an invention of the fervid brain of the party or parties responsible for the ad. Neither do any firemen or brakemen in this section of the country, nor I believe anywhere else at the present time, make $75 or $100 per month. That assertion is also a pipe dream. These latter figures represent about the average monthly wage earnings for conductors and engineers who have put in about twenty years of their lives working their way up by degrees to the runs which make it possible for them to earn this monthly wage of $75 and $100. One of the purposes of such pernicious ads as the foregoing is by thus grossly exaggerating the amount being received as wages by railroad train service employes to mislead the public as to the possible earnings of such employes, so as to influence public opinion to their detriment when they are endeavoring to maintain the standard of wages.

I do most emphatically protest against ads such as these appearing in the daily press. They are untruthful in every particular and intended to deceive. I venture to say that not a railroad in the Pittsburg District has employed any new firemen or brakemen for over a year. Then why these ads? Our members everywhere should assist as far as possible in keeping the unwary from giving heed to such diabolically false and designedly deceptive statements. There is such a thing possible as *flooding the market*, as by overstocking a railroad or division of road with more men than is necessary for handling the business, thus resulting in about all the men making only half time. Some railroad managements have special motives in establishing such conditions—motives similar to those which actuate certain coal operators in the adoption of the company store and company house-rent scheme, and which have met with so much just and vigorous condemnation from the public as well as the miners' organizations and miners generally. Such railroad companies have an ax of some kind to grind—in some instances a "Voluntary (?) Relief Department" ax.

In the light of recent events these ads would indicate that a policy similar to that of the coal operators was being experimented with by some railroad—the object in view is not far to seek. But this much I wish to say, that all the wealth they pile up as a result of the "flooding the labor market game" cannot in the long run expiate their crime of thus inducing young men to leave home or some other employment to take up with a flattering offer which in the test proves to be no more real than Dead Sea fruit.

FAIR PLAY.



LET US FEDERATE

In his department in this issue the international President presents to the membership for their consideration a subject of the most vital importance to every man engaged in railroad train service, viz., "Federation." It is, as he truly says, second in importance only to organization itself. Many are the bitter lessons which have been taught as to how essential is federation to the complete success of the various Brotherhoods in carrying out the objects for which they are organized.

The extent to which the employing interests are "federating" through "general managers' associations" makes federation amongst the employes' organizations more necessary now than ever before. The general manager of an Eastern railroad in an address recently delivered before a body of students said, "the railroad official is trained to strive for net results—that is profit."

Railroad officials are all endeavoring to make a showing for themselves, and the more effectively they assist in "reducing expenses of operation" for the company the more highly will their services be estimated by the interests employing them.

There is nothing after organization itself that will contribute more effectively to increased wages and desirable working conditions than a firm, compact and indissoluble system of federation amongst the railroad employes' organizations. To maintain what has been secured also requires concerted effort. It is, therefore, quite natural for some to note with gratification any lack of unity or harmony amongst those organizations, for they full well realize that such disunion or dissension detracts from their effectiveness.

Railroad employes' organizations have all had demonstrations of the great advantage of federation and, as already stated, they have also had some undesirable erperiences from which their members have learned something of the great disadvantages of being without it. If the membership of the various organizations declare in favor of federation we will have federation, and the sooner they do so the better will it be for all. In view of the extent to which capital is concentrating it is no longer a matter of choice, but one of absolute necessity that labor also concentrate its forces if the objects of the trades union movement are to be attained.

Our members should weigh well the words of the international President, and, acting upon them, should exert their every influence in promoting and advancing the great principle of federation amongst the railroad Brotherhoods.

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Notice.

The Magazine office is very anxious to procure copies of the Directory as follows: Fourth quarter of 1904; the second half of 1906 and the first half of 1907. Any one in possession of the above named copies of the Directory will please correspond with John F. McNamee, Editor and Manager, Traction Terminal Building, Indianapolis, Ind.

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Winnipeg Grand Union Meeting.

Preparations for the Winnipeg Grand Union Meeting go on apace and it is the determination of the brothers in that vicinity to have the coming gathering of our Brotherhood to be held in that city on August 3d, 4th, 5th and 6th next, eclipse all other union meetings that have thus far been held under the auspices of the order.

A visit to the Canadian capital of the great Northwest will prove to be a most entertaining vacation trip for all who can avail themselves of the pleasure of attending the union meeting, Winnipeg is a thriving, prosperous, and progressive city. Eighteen railroads radiate from that city. Extensive shops of the Canadian Pacific, Canadian Northwest and the Grand Trunk Pacific railways are located there and it is the fourth city in manufacturing in Canada. Its output in manufactures represented in 1907 $22,000,000. Winnipeg has two navigable rivers and has an area of 13,990 acres and a population of 115,000. It has 102 churches and 28 schools. It has a public library that cost $100,000, and is the home of Manitoba's agricultural college. It has 18 banks, 3 live daily newspapers, 42 weekly and monthly publications and is the greatest grain market in the entire British empire. Winnipeg is the center of a rich and fast developing country; enterprise, progress, push and activity are everywhere evident in its busy life. A visit to that city is well worth laying plans for, and there can be no more favorable opportunity for our people to make that visit than during the Brotherhood Union Meeting to be held in Winnipeg during the first week in August.

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Federated Boards.

In accordance with Section 217 of the Constitution the Federated Boards of the B. of L. F. and E. are being organized. On April 5th the Western Federated Board met in Chicago and organized. The Board was in session four days and many matters of importance were discussed and disposed of.

The Eastern Federated Board also met on April 19th at Buffalo, N. Y., and organized, that Board also disposing of much business of importance, and arrangements are now being made to organize the Southern Federated Board in the near future.

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A Veteran with a Record to Be Proud of.

Bro. James D. White, a veteran member of our Brotherhood, at present a member of Eureka Lodge 14, formerly a member of Tippecanoe Lodge 36 and a charter member of Vigo Lodge 16, recently visited the Magazine office, bringing with him a copy of the October, 1881, issue of the Magazine in which appeared a notice of his wedding—his good wife, Mrs. Samantha C. White, having passed away on February 14th last.

A comparison between the copy of the October, 1881, issue of the Magazine and the Magazine as it is published today is a clear demonstration of the power of organization amongst working men and goes plainly to show what can be accomplished through united and concerted effort on the part of wage-earners. It is also an incentive to us to continue the good work and perfect the organization of the men of our calling.

Brother White, who became a member in May, 1875, has held continuous membership ever since, never being even once suspended for any cause whatever. This is certainly a membership record of which any man might well be proud.

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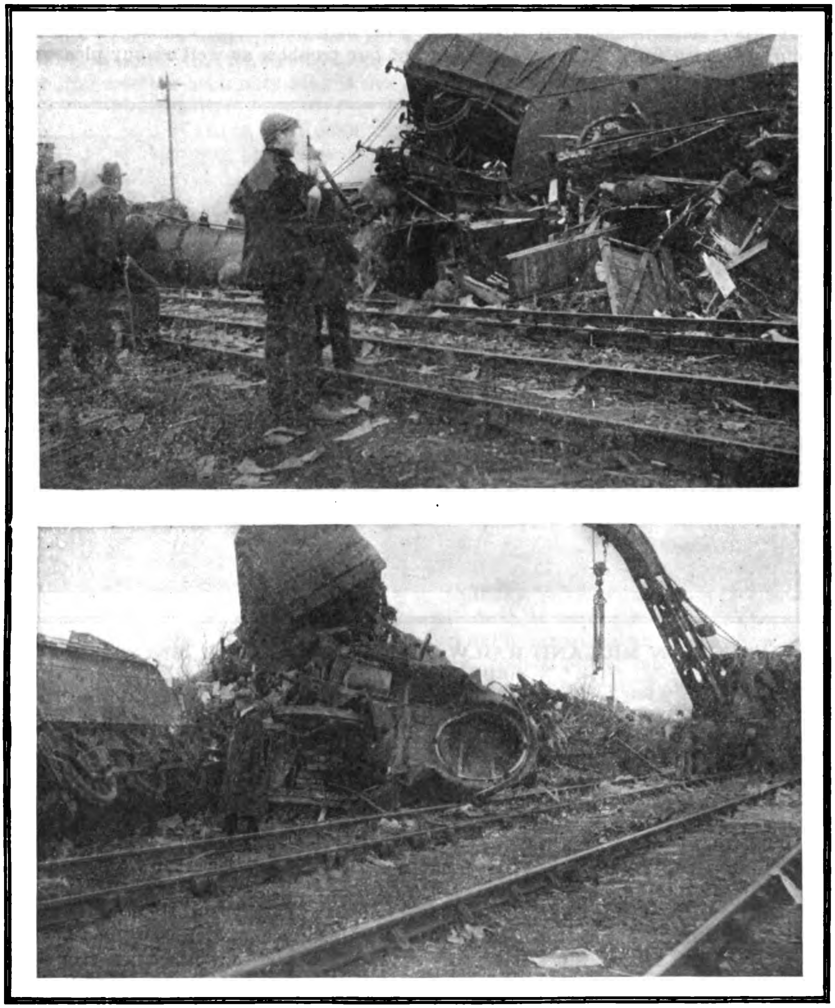
Brother Fox Sends Message of Fraternal Greeting—He Tells of An English Wreck.

Bro. Albert Fox, General Secretary of the Associated Society of Locomotive Engineers and Firemen of Great Britain, in a recent letter to the Editor requests him to extend through the columns of the Magazine his best fraternal greetings to all the boys of the B. of L. F. and E., and to say that he often thinks about us since he has had the pleasure of meeting with so many of our men at the Columbus Convention.

Brother Fox is busily engaged preparing for the convention, or conference, of his association to be held in Leeds, England, commencing May 18th.

He states that he is having numerous reminders from our boys in the form of souvenir post cards, letters, etc., and that they are no longer strangers to him or the organization he represents. Brother Fox says that they are looking forward with much pleasant anticipation to Brother Carter's visit.



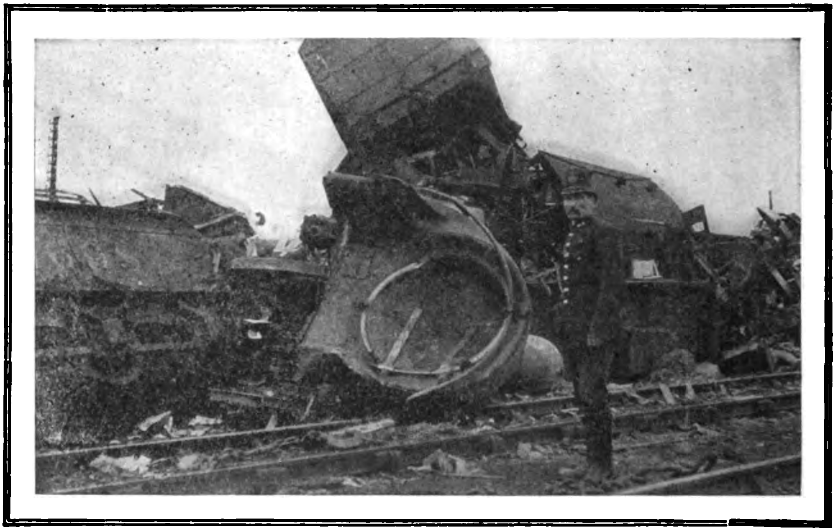
WRECK ON MIDLAND RAILWAY, AT SHARNBROOK, ENGLAND, FEBRUARY 4, 1909

A Bad English Wreck.

In the same letter Brother Fox gives an account of a recent railroad wreck in England which, judging from the pictures we publish herewith (through his courtesy), has not often been surpassed in accidents of this kind from a standpoint of demolition of rolling stock. In referring to the matter in his letter Brother Fox says:

"I am enclosing you a picture or two of a smash that we had at Sharnbrook on the Midland Railway on February 4th, but these pictures only give a very faint idea of what it really was, as they do not take in sufficient of the wreck to show how bad it was. The boys on the engines were buried underneath the debris until the next day. It occurred in this way: The signalman had shunted (switched) a train on to the same road on which he had an express goods (fast freight) coming—same being worked by a four-coupled express passenger engine. He was intending to cross this train on to the other road immediately after the passenger train went by, but he forgot to pull over his cross-over points (switches) and thus he was able to pull the signals off for the oncoming train which kept coming down the grade with all signals off at about fifty miles per hour without the signal man finding out his mistake. As a result this train crashed into the other one at full speed, colliding with the engine, of course. The resistance was terrible and I never in all my life saw engines or rolling stock so badly wrecked.

"It broke the framing of the passenger engine completely in two, both sides, and carried the bogie wheels away, broke off the smoke box completely, smashed the cabs and all the fittings and besides wrecked the whole train. The driver (engineer) of the oncoming express was a member of our association and leaves a widow and six children, and I assure you it was a very trying experience for me at the inquest when I accompanied his widow to view the body. I hesitate about sending you this kind of news, as I realize that your boys have quite as much of this sort of thing to go through with as they want to know of, but really, Brother McNamee, since my visit to your convention there is such a true fraternal feeling existing between our boys and your own that I feel I must tell you some of our troubles as well as our pleasures."



WRECK ON MIDLAND RAILWAY, AT SHARNBROOK, ENGLAND, FEBRUARY 4, 1909

General Chairman's Association of the Brotherhood of Locomotive Firemen and Enginemen.

SEDALIA, Mo., March 1, 1909.

To the Chairmen of All Joint Protective Boards, Brotherhood of Locomotive Firemen and Enginemen:

You are hereby notified that the ninth annual meeting of the General Chairman's Association will be held in Chicago, Illinois on Monday, May 3, 1909, at the Lexington Hotel, corner of Michigan boulevard and Twenty-second street.

The future of the Association will be one of the important features of discussion at this meeting, and we urge upon each of you the importance of attending. Matters of direct concern to the Federated Boards, the Joint Protective Boards and the General Chairmen will receive much attention.

We are starting out upon a new era in

the protective department of the Brotherhood and the new policy adopted at the Eleventh Biennial Convention will receive the attention of all present at this meeting of the Association. We expect to have a very interesting meeting and trust that you can be with us.

General Chairmen not members of the Association are extended a cordial invitation to affiliate with us and to be present at the meeting beginning May 3 next.

Fraternally yours,
WALTER D. MOORE,
[SEAL.] Secretary and Treasurer.
A. BARTLETT,
Chairman.

* * *

Brother Gear Promoted.

Bro. F. N. Gear, of Lodge 10, who has been Assistant Grand Secretary and Treasurer of the Brotherhood of Interurban Trainmen, has been made Grand Secretary and Treasurer of that order to fill the vacancy created by the resignation of Bro. H. W. Merritt.

* * *

Baltimore Fifth Sunday Union Meeting—A Most Pleasant and Profitable Time Insured.

Judging from the nature of the arrangements for the next Fifth Sunday Union Meeting to be held under the auspices of Lodge 214, at Baltimore, Md., beginning on Saturday, May 29th, and continuing through the 30th and 31st, a rare treat in the way of a profitable and interesting, as well as enjoyable time, is in store for all who can arrange to attend.

Baltimore is the sixth city in the United States in population and stands prominently amongst the most interesting. Fort McHenry, famous for the origin of the "Star-Spangled Banner," stands as a noble guard to the harbor from the north fork of the Patapsco River. Baltimore is known sometimes as the "Monumental City," owing to its two noted landmarks, viz., the Washington monument in Mount Vernon Place and Battle monument in Monument Square. Both of these monuments are of white marble and are very handsome. Baltimore's city hall, also built of white marble, covers an entire square. Other buildings noted for their handsome appearance are the Peabody Institute, the Enoch Pratt Free Library, the Masonic Temple, the Johns Hopkins Hospital and the Romanesque Maryland Clubhouse. There are many beautiful churches in Baltimore, as well as splendid educational buildings. Perhaps the finest of these is the Johns Hopkins University, which was opened in the year 1876. Baltimore is well supplied with beautiful and interesting parks. Druid Hill Park on the north side is said to be about the finest in the United States, Patterson Park and Carroll Park commanding much admiration also. Baltimore is the head of navigation for Chesapeake Bay, and her harbor is indeed a busy one.

The members of Oriole Lodge No. 214 are sparing no effort to make the coming Fifth Sunday Meeting one long to be remembered.

The program is as follows:

Saturday, May 29th. In the morning at 9:00 a. m. and in the afternoon at 2:30 p. m boats will leave for Tolchester Beach, going directly across to Chesapeake Bay, thus giving an excellent view of Baltimore's noted harbor, also her historic forts, McHenry and Carroll. Chesapeake Bay is considered the most beautiful body of water in the United States by moonlight. Complimentary tickets will be furnished to all visitors.

Sunday, May 30th. A secret meeting will be held at the Maryland Theater on Franklin street, near Howard, at 1:30 p. m., and a public meeting will be held in the evening at 7:30 in the same theater.

Monday, May 31st. A public meeting has been arranged for in the morning. The visiting ladies will be entertained on this day by the members of L. S. 116, the afternoon to be spent in general sight-seeing. Arrangements have been made to spend the evening at Electric Park, the inland Coney Island of the South. It is a beautiful park with its maze of electric lights, fireworks, etc. There will be dancing and other amusements, for which tickets of admission will be sold to visitors at greatly reduced rates. The trip to the park will be made by trolley through one of the finest portions of the city and suburbs. Excursions will be run to Washington, D. C., and Annapolis, where the Naval School and war ships can be inspected.

The committee in charge of the arrangements, which includes Bros. G. W. Rutter, Chairman; C. W. Phillips, Asst. Chairman; C. E. Potts, J. A. Warren and T. M. Smith, will meet all trains and direct the visitors to headquarters, which will be at the St. Charles Hotel.

Hotel rates have been arranged for as follows: Hotel Raleigh, $1.00 for one in a room, $1.50 for two; Lexington, Kernan, St. Charles, the Club, and North Hampton will also accept visitors at the same rate as the Raleigh. The New Howard Hotel will charge a rate of $1.50 for one in a room.

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Notice.

The following item for the addresses wanted column reached us after the department containing same had been sent to the foundry, hence the reason for its appearance here:

Herbert G. Newman.—Was a member of Silver Lake Lodge 620 at one time. Has not been heard from for three years. At that time he was running on the Chicago & Eastern Illinois Railroad. His mother is very ill and not expected to live and is very anxious to see him before passing away. Anyone knowing his whereabouts or in possession of any information regarding him will please correspond with Mrs. S. A. Colby, Excelsior, Minn.

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Sparks.

Determination is the first essential to the accomplishment of any purpose, and, as we have commenced a crusade of organization, every member of the Brotherhood should engage in the work with a determination to do his full part in enlisting in our great industrial army every man that is eligible to its ranks.

Make arrangements now to attend the Baltimore Fifth Sunday Union Meeting, which opens on May 29th and continues through the 31st.

We are still in a position to supply all calls for charts and printed descriptive matter of the New No. 6 ET Locomotive Brake Equipment. Send your remittance of 15 cents (which is all it costs) to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

It is vastly to the interest of each and every individual member that the Brotherhood be as strong as it can possibly be made. The general officers are doing their share in this great work and it is to be earnestly hoped that every member of the Brotherhood will do his share also.

Persons desiring to attend the Winnipeg Union Meeting should correspond with Bro. George F. Collings, room 23 Empress block, Main street, Winnipeg, Man., Canada. The meeting will take place on August 3d, 4th, 5th and 6th.

A bound volume of the B. of L. F. and E. Magazine for 1908 will be sent express prepaid to any part of the United States, Canada or Mexico upon receipt of $2.50. There are many articles and illustrations of the latest and most up-to-date locomotive appliances that no wide-awake railroad man, who has it in mind to become a superintendent or master mechanic, or in fact to climb the ladder of success in any railroad capacity, can afford to miss. All remittances should be addressed to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Keep your address correct and thus keep your file of the Magazine intact. Just a postal showing your latest street number with request for change is all that is necessary.

The Baltimore Fifth Sunday Union Meeting bids fair to be an unusually interesting, entertaining and profitable one. It will take place on the 29th of the current month, continuing through to the 31st.

Orders keep coming in for copies of the Catechism of the Electric Headlight. This is one of the best books, vest pocket size, on the subject of the electric headlight that has ever been published. Price 50 cents, postpaid to any address within the United States, Canada or Mexico. Address all orders to John F. McNamee, Editor and Manager, Traction Terminal Bldg,, Indianapolis, Ind.

If you know of any non-Brotherhood firemen who are eligible to membership in our Order, lose no time in explaining to them how inconsistent their position is, and showing them how necessary it is that all members of our calling should be solidly organized under the banner of our Brotherhood.

Make arrangements now to attend the Winnipeg Grand Union Meeting to be held on August 3d, 4th, 5th and 6th next.

Bro. Henry L. Berlin, of Lodge 162, has a number of back copies of the Magazine for the years 1903, 1904, 1905, 1906, 1907 and 1908, which he will sell. He also has a full set of Kirkman's Science of Railways, consisting of twenty-one volumes, in good condition, that he will sell at a reasonable figure. Those interested can correspond with Brother Berlin at his address, 118 Gibbons street, Toledo, Ohio.

The bound volume of the Magazine for 1908 is now ready and will be sent to any address in the United States, Canada or Mexico for $2.50, express prepaid. This volume, like all previous ones, contains articles and cuts descriptive of the latest railroad appliances and will prove a valuable addition to any railroad man's library.

Remember the coming Baltimore Fifth Sunday Union Meeting and make your arrangements to be present. Particulars are given elsewhere in this issue.

Mr. Ed Durfur, of Manila, Ark., writes the Magazine office that he has a complete Scranton Course of which he is willing to dispose, also latest charts. Interested parties should correspond with Mr. Durfur at the above address.

An Instruction Diagram of Piping Connections of the No. 6 ET Locomotive Brake Equipment in eleven colors, together with printed matter descriptive of same, will be sent to any address on receipt of 15 cents. Address all orders to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Remember, brothers, that complete organization is one-half the battle in defending our rights. No fireman who is eligible to membership should be outside of the ranks of our Brotherhood.

Owing to the many roads that are adopting the electric headlight, we believe it would be very advisable for all railroad men who have not thus far sent for one of our Catechisms of the Electric Headlight to do so at once. They will then be equipped with the proper knowledge to handle it when their road adopts it, or if it has done so already. Fifty cents is all the little Catechism costs. Send your remittance to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

The brothers who are looking after the coming Winnipeg Grand Union Meeting to take place beginning on August 3d next and continuing four days, are putting forth their best efforts to make it a meeting, which for profit and entertainment, will excel any in the history of the Brotherhood. Make up your mind to be in attendance if at all possible. See particulars elsewhere in this issue.

We regret to announce that notwithstanding all that has been published in the Magazine regarding anonymous communications we still continue to receive them. We cannot give attention to any matter that is sent to this office, unless the author shows his good faith by signing his name. Same will be withheld from publication if he so directs.

It is the duty of each and every one of our members to constitute himself a committee of one to see to it that those men who by right ought to be within our ranks, but who have not yet joined us, become members of our Order with as little delay as possible.

The Fifth Sunday Baltimore Union Meeting to be held under the auspices of Lodge 214 beginning on the 29th inst. and lasting three days will be an event that will be remembered by all who can attend.

Our insurance is excelled by none, and when a member stops to think of the thousands whom that feature of our Brotherhood has saved from want in the past it should inspire him to exert his best effort with a view to bringing our Order up to the highest numerical standard possible.

If you are desirous of becoming better acquainted with the operation and maintenance of the electric headlight, you can not do better than to secure a copy of our little book, the Catechism of the Electric Headlight, which will be sent postpaid to your address upon receipt of 50 cents.

All orders should be addressed to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Keep up the work of helping to secure that 90,000 for St. Paul. Constant and persistent effort will be crowned with success. Let Perseverance be your watchword.

Perseverance was once defined by an old colored preacher as follows: "First, to take hold. Second, to hold on and, thirdly, to nebber let go." We should conduct our work of organization with perseverance.

If you are studying the new No. 6 ET locomotive brake equipment you should have a copy of our Instruction Diagram of Piping Connections, in eleven colors, together with printed matter descriptive of same. Price 15 cents, postpaid. Send your order to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

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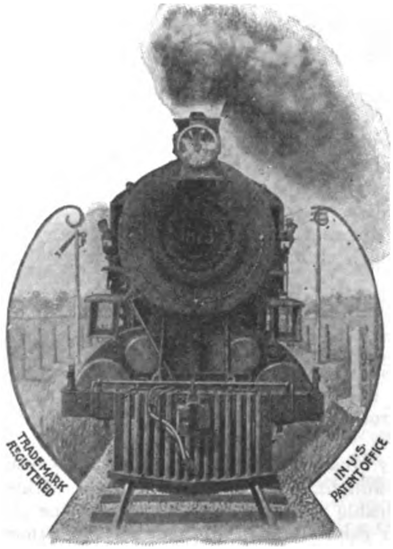

FROM THE PRESIDENT

Federation.

Next to the organization of the many locomotive firemen who now are members of no union, the most important subject for discussion is the federation of the organizations of railway employes.

Defensive measures are seldom thought of until those who would be protected by such measures begin to realize that they have failed to prepare for defense. When conditions are prosperous no one gives a thought to "hard times."

Usually thousands of men are out of employment before those who are responsible for the welfare of their organizations begin to think of what might have been done.

Fortunately, a plan of federation was adopted years ago and has been placed in effect on several occasions in the past, and usually has been found of great benefit.

The members of the B. of L. F. and E. should consult with the members of other Brotherhoods and endeavor to bring about a defensive movement by federating under what is known as the "Cedar Rapids Plan."

In order that all may be familiar with the details of this plan of federation, the eleven rules, which were originally agreed to, and amended on July 15, 1903, are herewith reproduced. Attention is called to the fact, however, that quite recently the Order of Railroad Telegraphers has withdrawn from the federation and has affiliated with the Railroad Department of the A. F. of L. The rules are as follows:

Section 1. The membership of any of the following named organizations: Brotherhood of Locomotive Engineers, Brotherhood of Locomotive Firemen, Order of Railway Conductors, Brotherhood of Railroad Trainmen and Order of Railroad Telegraphers, may federate as hereinafter provided on any system of railway, for the purpose of adjusting any complaint which may be presented in accordance with the laws of the organization aggrieved, and in accordance with requirements herein contained.

No organization participating in this Federation or members thereof shall be or become a part of any other federation, organization or alliance of railway employes.

Sec. 2. Where federation hereunder is desired on any system, the proposition shall be submitted to the membership on the system by the chairmen of the general committees or boards of adjustment of the organizations desiring to federate, through the members of the general committees or boards of adjustment. When two-thirds of the members of the organization have voted in favor of federating, the chairman and secretary of the general committee or board of adjustment may sign a copy of these articles with the chairmen and secretaries of the other organizations which have also voted to federate and the copies so signed shall be forwarded to the chief executives of the organizations party to the federation, for their approval, and when so approved shall be effective.

Sec. 3. Complaints from the members of any organization shall be handled by that organization in accord with its laws and through its regular committees. When the general committee or board of adjustment find it impossible to adjust a complaint or case legally placed in their hands, the secretary of such committee or board shall forward to the chief executive of the organization a full and complete statement of the complaint, and the action taken, which shall be signed by the members of the committee. When directed by the chief executive (in person, in writing or by telegraph), copies of this statement, with notice of time and place of meeting, shall be forwarded by the officers of the general committee or board of adjustment to the chairmen and secretaries of the general committees or boards of adjustment of the organizations party to the federation.

Sec. 4. On receipt of statement as provided in Section 3, the chairman and secretary of any general committee or board of adjustment representing an organization participating in the federation, shall answer the call in person, meeting the others at time and place named. When so convened, the several general chairmen and secretaries shall constitute the federated board for that system, and shall organize by the election of a chairman and a secretary, who shall serve until their successors are elected. After such organization, they shall, if they approve the complaint, exert every honorable effort to adjust the same.

Sec. 5. When the federated board have, after exhausting all honorable efforts, failed to adjust the complaint referred to them, and when the chief executive officer of the organization aggrieved is prepared to approve a strike, he may convene the chief executives of all organizations represented in the federation, and in the event of it becoming necessary to inaugurate a strike the same shall be authorized only by a two-thirds vote of the federated board and the consent of the chief executives of the organizations represented.

Sec. 6. Should a strike be inaugurated, the chief executive of the organization aggrieved shall be the recognized leader. Two-thirds of the federated board together with the chief executives shall have power to declare a strike off.

Sec. 7. The expenses incurred in the settlement of any complaint (or in case of a strike) shall be paid by each organization in accordance with the provisions of their respective constitutions and by-laws.

Sec. 8. Any organization that is a part of this federation, failing to comply with the rules and regulations contained herein, shall not receive any support or recognition from any organization embraced in this federation on the system upon which the violation occurs; but no organization will be deprived of the benefits of this federation by reason of the acts of its representatives, or its individual members, until such time as it has approved of the action by failure to discipline the parties at fault, and then only after proper trial and conviction by a two-thirds vote of the federated board, subject to an appeal to the executives of the organizations parties hereto. An organization on trial shall have no vote in the federated board during its own trial.

Sec. 9. If a federation is formed on any system which does not include all the organizations herein named, the others shall be eligible to membership, and may file application for such membership with the secretary of the federated board. Upon receipt of such application, he will forward the same to the chairman of each general committee or board of adjustment, party to the federation, who will in turn submit it to his associates. Upon receipt of the vote of his associates, he shall file with the secretary of the federated board the vote of his organization in accordance therewith, and the organization applying for membership shall be admitted if a majority of the organizations, party to the federation, vote in favor of such admission.

When an organization is admitted to the federation under this section on any system, the chairman and secretary of the federated board shall give the secretary of the general committee or board of adjustment of the admitted organization a signed statement, in duplicate, to that effect. These statements shall be forwarded by the secretary of the general committee or board of adjustment to the executive of that organization for his approval, one to be retained by him and one to be returned. When copy approved by the executive is filed with the secretary of the federated board the admission will be complete and effective. The chief executive approving such admission shall officially notify the executives of the other organizations parties to the federation on that system that he has approved the admission of his organization thereto, and the secretary of the federated board will notify the executives of the other organizations parties to the federation on that system when approved copy of notice of admission is filed with him.

Sec. 10. An organization on any system may withdraw from federation for that system hereunder by submitting such proposition to the membership of that organization on the system, and if a majority of the members vote in favor of withdrawal, the general chairman and secretary of that organization shall notify, in writing, the chairman and secretary of the federated board for that system, and the chief executive of the organization withdrawing. The withdrawal shall be effective fifteen days after date of notice to officers of federated board.

Sec. 11. These articles may be revised, altered or amended by concurrence of all of the executives of the organizations parties hereto.

The members of any of the four Brotherhoods can secure further instructions and blank agreements for this plan of federation by addressing their respective international officers. It is hoped that the members of all organizations will become interested in this movement.

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FROM THE GENERAL SECRETARY AND TREASURER

Transfer of Members.

Under the present law a member desiring to transfer from one lodge to another may do so providing the lodge from which he desires to transfer does not file objections to his transfer with this office within 15 days (after notification). If no objections are received the transfer will be made, *but will not be effective until the first day of the second month after application for transfer is made.*

When a member transfers he must pay all assessments to the lodge from which he desires to transfer that are due ON or BEFORE the first day of the second month following that in which he makes his application for transfer.

For example: Should a member of any lodge make request on the recording secretary of another lodge to apply for his transfer any time during the month of May, and there are no objections filed by the lodge of which he is a member, the transfer will be made on July 1st. This member must pay all assessments that are due in the month of June, *on* or *before* July 1st, to the financial secretary of the lodge from which he desires to transfer, and the treasurer of that lodge will remit all assessments due from this member so as to reach the Grand Lodge on or before July 20th. Said member should not under any circumstances pay any assessments into the lodge to which he is transferring until after July 1st.

Addresses of Lodge Officers.

It is very important that local lodge officers should keep this office advised of any change in their addresses. Many letters are returned marked "Unclaimed," and many times they contain important matters. We have the Directory changed each week in an endeavor to have the names and addresses of all local lodge officers as near correct as possible, and if officers will only drop a line just as soon as they change their address, it will assist us very materially in getting mail to them more promptly. Now that financial secretaries have much to do with the Grand Lodge, they should be careful to keep us advised of their correct addresses.

Do Not Forward Statements.

Many financial secretaries have forwarded their Forms B-58 to this office. This should not be done, as the treasurer is the only one required to send statements with money. One of these forms should be turned over to the treasurer and the other retained by the financial secretary.

Financial Secretaries Should Be Particular to Sign Their Names to All Reports of Expulsions and Applications for Readmission.

Quarterly Pass.

All members who pay their assessments, if for only one month, are entitled to the password for that quarter.

It was not deemed advisable by the committee which revised the Ritual to make the password good for only one month, for then nearly all the members would be without the password most of the time.

It will be understood that any member attending a meeting of his lodge must be in good standing at all times, and the financial secretary of the lodge will know if he is in good standing. While he may know the password for the quarter, yet he must also have his receipt for the assessment due in the month in which he attends meetings.

A member visiting a sister lodge and having an order for the secret work will be entitled to receive the password for the quarter in which he visits. But should a member desire to visit a sister lodge any time during the quarter, even if he has the password, he must also have his receipt for all assessments due for the month in which he visits. The warden of the lodge in examining a visitor must insist that such visitor have a receipt for all assessments due at the time of said meeting.

Recognition Sign.

For the information of all members who have in the past been accustomed to getting the quarterly recognition sign, will say that beginning April 1st the sign to be used outside of the lodge room has been discontinued, and there is now no way of recognizing a member outside of the lodge room except by use of the traveling card.

Traveling Cards.

The same law is in effect relative to the time for which a traveling card is good, as prior to April 1st. Traveling cards can only be made good for the length of time that a member has his assessments paid. If a member only pays assessments for one month, recording secretaries should only make the card good for that month. Should a member pay his assessments for three months his traveling card can be made good for three months, but in no case can it be made good to exceed three months. Recording secretaries before issuing traveling cards for a longer period than one month should be sure that the member has paid all assessments due up to the last day for which the card is made good. Before issuing a card to a member, especially one who is traveling seeking employment, the president and recording secretary should be sure the member is familiar with the use of the card.

Accident Indemnity Department.

It must be understood by all members who desire to vote "for" or "against" the creating of this department, that their ballots must be in the hands of the recording secretary in time that he can forward it to the Grand Lodge so as to reach there not later than June 1, 1909. *Ballots received after June 1st will not be counted.*

Members must also understand that in signing their ballots, they must also put their lodge number on same.

Many inquiries are being made as to whether or not it will be compulsory for members to participate in this department, provided it is established.

It will be entirely optional with members as to their taking out a certificate in this department. *But under the laws of the State of Illinois, a member who is not carrying a certificate in this department* (should same be established) *cannot take part in making any changes in the laws relating to this department.* The Beneficiary Department being compulsory, all members, except non-beneficiary and honorary members are permitted to be delegates and vote to make such changes in the laws governing this department as in their judgment is for the best interests of the department. But the Accident Indemnity Department being optional, a member to assist in making laws to govern this department must be a participant therein.

We want a full vote on this subject, and I urge every member, who has not cast his ballot, to do so at once. If you have no ballot, get one from the recording secretary of your lodge, sign the same and return it to him at once.

Rubber Stamps.

Again referring to stamps for use of the financial secretary, I desire to say that it takes about a week from the time the order is received until they can be made and forwarded from this office. In order to get them as cheaply as possible, orders are only turned in to the stamp works once each week.

Postage on Mail Sent to the Grand Lodge.

So much mail is arriving at this office without the necessary amount of postage affixed thereto that I feel it necessary to call your attention to the same. In sending mail to this office be sure that you have affixed the required amount of postage. Treasurers in sending statements to the Grand Lodge should put four (4) cents in stamps on the envelope, as it requires that amount.

Murphy Monument Fund.

Received by A. H. Hawley, General Secretary and Treasurer, from March 13 to and including April 12, 1909:

The following lodges have remitted $1.50 each: 438, 564, 599, 642, 730	$7 50
J. H. Bartlett, member Lodge 642	75
Thomas Colley, member Lodge 642	25
J. W. Crouse, member Lodge 642	50
H. G. Humphrey, member Lodge 642	25
A. O. Smith, member Lodge 642.	75
Total for month	$10 00
Previously reported	694 70
Total receipts to date........	$704 70

Forum

Accident Benefits.

We have something tangible in our hands on the matter of an accident indemnity, in the proposed law gotten up by the Board of Directors and now submitted to our vote. As I stated before in writing on this matter, it must be accepted as a first principle that the members of any association must pay the expenses of the association, for there is no other fund to help them. The Board of Directors have made some calculations and have fixed upon certain figures to start with, but (as they explain "it is an experiment") they are by this proposed law given the power to increase or diminish the assessments as the case may demand. If the law as proposed becomes effective the members can see what the Board thought would be the yearly rate, but it is only time that will tell whether they thought or guessed aright.

The rate given in the new law for a $20 per week indemnity is $22 per year; with $1,000 principal sum $26.60; with $2,000 principal sum $31 per year. The question now arises are these rates anywhere near the mark? What is the death rate among ordinary men, say, averaging 30 years? What is the rate of accidents and the rate of weekly indemnity required?

Turning to ordinary mortality tables we find that out of 1,000 men 25 years old an average of 7 die per year; out of 1,000 30 years old an average of 10 die; out of 1,000 35 years old the average is some over 10 and at 40 years old it rises to 13 per year per 1,000. When we look at the mortality among our Brotherhood we meet a surprise, hardly to be expected among a class of men exposed to the changes of weather and temperature as our members are. The death and disability claims paid during the last 12 months were about 550 and 275 of them were by accident. This brings the death and disability claims to a trifle over 8 per 1,000 of our members and when the accidental cases are eliminated reduces our ordinary death rate to but a trifle over 4 per 1,000 members. This is a remarkably low percentage, and it is a matter of doubt whether any other mutual insurance association can equal this record. If there is one let us hear from them. Eight to the 1,000 means that the payment of $8 per year would be enough to pay on a $1,000, or $12 per year on a $1,500 policy. Of course we will have to add enough to cover the expenses of collection and disbursement, besides also paying for the incidental privileges of membership. At the Toronto Convention it was reported that $8 had paid $1,000 policies in the past and that it would be safe to raise the policies to $1,500, as it would in all probability not cost us over $12 per year to keep up to that figure. It is costing us a little more, but not enough to account for the 25 years of age which has passed since then. The low death-rate above shown as prevailing in our Order is in part due to the policy of our friends—the B. L. E.—in insisting that men who joined our Order when they were young shall quit us when they get old and that they (the B. L. E.) then assume and pay for the additional risk which the years impose. While this beyond any manner of doubt accounts for some of the low rate, there must be something about the work that enables our members to withstand exposures and the changes of weather and to make them a tough proposition for even death, disability or sickness to tackle.

Coming back to figures again we take four to a thousand as the accident rate and the Interstate Commerce Commission informs us that 20 are injured to 1 killed. We now have some figures, but we do not yet know what the average cost of each injury may be? If the accident rate is 4 per 1,000 then $4 ought to pay for $1,000 principal sum, as our Board has figured, for they make a difference of $4.60 between the weekly $20 indemnity and the $1,000 principal sum and $9 difference between the $20 weekly indemnity and the $2,000 principal sum. This would indicate that the Board is not very far out of the way on those figures and that they must have figured on the low rate which exists in our Order.

If 20 are hurt to 4 killed we would have 80 per 1,000 injured, but how badly is still the question? The Board has fixed a rate on weekly indemnity which is four times as high as the cost on the principal sum, indicating that each injury costs $50 on an average, which cuts the figure down to an average of about 15 days, and you know that is not much of a railroad hurt that can be healed in that time. The plan may be as near correct as can be made by human foresight, and time only will show whether it is quite the thing, but if the members will be willing to submit to an increase of assessments if needed (it is hardly necessary to add to a decrease if too much gets on hand) then the association will be able to go on undismayed, but if the members will growl because some other member gets himself hurt and uses up some of the fund, it were far better for them to hold their money in their own hands and be sure it did not get away.

W. W.

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Interesting Brotherhood History on Two Important Divisions Pennsylvania Main Line.

Having been a constant reader of the Magazine for a number of years, and a member of the good old "Tried and True," I thought perhaps a little history would be of interest concerning the organization of a lodge which has been an important component factor in the Brotherhood structure of one of the greatest, if not the greatest railroad system in the world today, and particularly so as that lodge has not been heard from through the columns of the Magazine for some time. Again, perchance this contribution may arouse the interest of our members and cause some other brother to contribute something for publication. The lodge to which I refer is Orphans' Hope Lodge 466, of Dennison, Ohio, and as best my memory serves me the following is its history:

Orphans' Hope Lodge was organized on August 18, 1891, by Bro. John J. Hannahan, then Vice-Grand Master of the B. of L. F., with twelve charter members as follows: Bros. E. M. Young, C. L. Fisher, Chas. Bayletts, A. L. Thomas, Dennis Rock, Alex Price, C. H. Clendenning, D. L. Bonham, J. E. Lightell, W. H. Nusbaum, Ed Englehard, of Three Brothers' Lodge 235, Pittsburg, Pa., and George Wickett, of Challenge Lodge 66, Belleville, Canada, the two last named coming in as charter members by transfer cards. The lodge room was then in the Bovey Block in the top floor corner of Center and Fourth streets. Its first set of officers consisted of the following brothers: Master, Ed. Englehard; Past Master, E. M. Young; Collector, J. E. Lightell; Vice-Master, George Wickett; Secretary, C. H. Clendenning; Receiver, Charles Bayletts; Warden, Dennis Rock; Chaplain, D. L. Bonham, and Conductor, W. H. Nusbaum.

Lodge 466 was built upon the ashes of two former lodges preceding it, the last one being No. 319, which succumbed partly from the effects of the heavy assessments levied in 1888 and mostly from the neglect of its officers to faithfully perform their duties as such, and endeavor to hold the members together. Promotions about that time were fast compared with the present day. Then men only had to fire about two years or two years and a half to earn their promotion, and in many cases as soon as promoted these men seemed to lose all interest in their organization. The result was old Lodge 319 surrendered its charter, but a new set of men were coming on the stage of action, who realized the need of having a lodge established in Dennison, and very soon a movement was started to bring this about. This movement met with but little encouragement at first for the reason that those of the defunct lodge who still retained their membership in the organization had deposited their transfer cards with Lodge 9 at Columbus, Ohio, or Lodge 235 at Pittsburg, Pa., both of these being good, strong lodges. These men thought that another lodge could never again be built up at Dennison that would sustain itself. They, therefore, opposed the movement, but we are pleased to say that for once they erred in their judgment, as has been proven by the history of Lodge 466 since its organization 18 years ago. The panic of 1894 was very trying on the new lodge, but be it said to the credit of its members who showed their fidelity and loyalty during these trying times by the prompt payment of their dues and assessments—never allowing themselves to fall in arrears—we managed to weather through this storm of adversity. But few members were lost during the four years following the panic, which fact speaks far greater praise than words can express for the kind of stuff of which those boys were made.

When one takes into consideration that the average monthly earnings of firemen on freight during those four years was

$35.00, great credit is due their wives and mothers for their noble efforts in helping to maintain the lodge by interesting themselves to the extent of seeing that their husbands and sons kept their dues paid up, and attended lodge meetings regularly.

We must thank our late Past Grand Master, Frank P. Sargent, for part of our success. He came to Dennison and addressed a public meeting held by Lodge 466, and made a personal appeal to the wives and mothers of the firemen to interest themselves in the affairs of their husbands and sons, pointing out how vitally important it was for every fireman to be a member of the Brotherhood and keep himself in good standing at all times. Brother Sargent's words carried weight and we are proud to say brought splendid results, as was clearly evidenced in after years. I have heard wives of the firemen say how they had denied themselves a new dress or hat that their husbands could take that amount of money to pay their lodge dues. All honor to such noble types of Amercan womanhood.

Lodge 466 has experienced many ups and downs during the 18 years of its history. Its organization marked the first step in the reorganization of the Brotherhood of Locomotive Firemen on the Pennsylvania Lines west of Pittsburg, which reorganization, as all the old-time boys well know, resulted in securing for the firemen on that System substantially improved conditions of employment.

Our brother Editor was then a fireman on the Columbus or "Pop Corn" division, as it has always been known amongst the boys, running between Columbus, Ohio, and Dennison. He took a vigorous and enthusiastic part in the good work of organization, and the institution of Lodge 445 at Columbus, Ohio, was due to his efforts in that direction.

In conclusion will make mention of the "Old Guard" of the twelve original charter members. Only five are left, viz.: Bros. Wickett, Young, Fisher, Englehard and Rock. The first four mentioned passed over to the right side years ago, and are now classed amongst the older freight men. Bro. Dennis Rock left the road years ago and is now employed at his trade in the Dennison shops. Bro. C. H. Clendenning, the first secretary, also quit the road years ago on account of poor health and is now cashier in the freight offices at Wheeling, W. Va. Bro. A. L. Thomas, who also gave up railroading, having quit to engage in farming up in North Dakota two years ago, I regret to say met his death from a gunshot last fall. His body was brought back and buried at his old home near Indianapolis, a delegation of members from Lodge 466 being present to perform the last sad rites. He was one of the pillars of Lodge 466, was a charter member and held continuous membership for 17 years and was never known to be in arrears at any time. The remaining five charter members have scattered to various parts of the country and become lost to our knowledge. We have one brother in No. 466 whose record we regard with pride, viz., Bro. John C. Morrow, who is the engineer in charge of our city water works. Brother Morrow joined the B. of L. F. in 1884; was a member of old Lodge 319 at Dennison, and left the road in 1890 to accept the position he now holds. He paid every assessment levied during the Q. trouble in 1888. He has held continuous membership in the Brotherhood for 25 years, and has never been in arrears for dues or assessments. The boys when out fishing often drop in to see Brother Morrow and are always given a hearty welcome, as he is ever ready to drop all work for the time being to hear any news from the lodge.

We have a splendid set of efficient officers in charge of the affairs of our lodge at the present time. Our meetings are well attended and a very lively interest is manifested. We have a good big membership and to the credit of 466 she has never gone backward, but has always been a live, progressive lodge. We hope to be able to give an outing sometime during the coming summer to celebrate our eighteenth anniversary, which marks the time in every young man's life when it is considered he is big enough and old enough to go out in the world and take care of himself, so Lodge 466 is now big enough to do something. ROXY.

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Cost of Living to Engine Crews.

Statistics bearing on the compensation of train service employes as presented to the public carry with them the impression that the wages paid men in that class of railroad service are net—that such wages represent a clear income. Little do the people who are thus led to believe that railroad enginemen are well paid realize how they are deceived, if conditions generally relative to the matter of living expenses are similar to what they are on the Middle Division of the Grand Trunk, where I am at present employed—and I am led to believe that such conditions constitute the rule rather than the exception.

Having been a fireman for the last ten years and worked my way to promotion as engineer I can speak with authority on the subject of expenses. First, one is called from his boarding-house, the landlady gets his grip (lunch pail) ready and after having breakfast he starts for the roundhouse where he arrives 50 minutes before time to depart; gets into yard and is ordered with a manifest train and gets 100 miles over the division and is then sent elsewhere, some 50 miles distant to the north. By this time a man has been on duty 15 or 16 hours and is pulled for rest. He goes to bed at the Y. M. C. A., which if he be a member costs 15 cents. Things are dull and he lays at this point 24 hours or perhaps 30. Ere this time his grip (lunch pail) is finished and he is 150 miles away from home and has to buy meals at 25 cents each — three meals per day — which amounts to 75 cents. His bed costs 15 cents, making a total of 90 cents. He may lay at some other divisional point another 24 hours and something will occur and he may lay over another week before he receives a call to go to his home station. I can safely say it will cost four or five dollars before he gets away, and besides this his expenses are going on at home, which makes a railroad man have a double board-bill to pay. What does a $40.00 wage amount to and what can a man save under such conditions? How many men can comfortably live on $40.00 per month? No one unless our "Italian tube cleaners," and they can save and then retire to Italy's sunny dales and live independently, while we can't even approach the subject of matrimony to our lady-loves, and are fearful that while waiting for business to improve, our lady friends will get interested in some of our weekly wage brothers who have all day Sunday and Saturday half-holidays. I would suggest that our Y. M. C. A. membership fee should be $5.00 per year, with beds free at all Y. M. C. A.'s, and the price of meals 20 cents to all members. Our money is good or an order on our pay can be given to any railroad Y. M. C. A. This has already been worked O. K. As our noble Brotherhood stands, could not both the engineers and firemen get together and suggest some cheaper method of railroad men getting along while away from home and relieve the cost of living by having free beds, etc.? Transportation men have their cabooses and are at home at any point while away and have storage for food for a week—I think fair play ought to be exercised here.

MEMBER.

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Harmony the Watchword at Pitcairn (Pa.) Union Meeting of B. of L. E. and B. of L. F. and E.

A union meeting of members B. of L. E. and the B. of L. F. and E. was held at Pitcairn, Pa., on March 21st last, the object being to establish a better feeling between the two organizations, with a view to their co-operation for the common good of all. Between 475 and 500 brothers were present, all members of the two Brotherhoods, and representing almost every lodge in western Pennsylvania.

The meeting was called to order by Bro. R. J. Jackson, of Division 772, B. of L. E., acting as temporary chairman. Afterwards Bro. Joseph Michaels, of Lodge 235, B. of L. F. and E., presided as permanent chairman. Bro. W. S. Carter, our international President, was the first speaker, and on behalf of the men of our Order, gave a very instructive as well as entertaining address, showing us full well the fallacy of strife and contention and what a power we would be for good in the labor world, if we would cooperate. Bro. Carter made it clear that as a result of the two orders not working more in harmony and being more closely affiliated railway companies as well as some unscrupulous individuals are taking advantage of this condition to the detriment of all.

Bro. W. S. Stone, Grand Chief Engineer of the B. of L. E., on behalf of the men of that order followed Brother Carter, defining the word "brotherhood" in a manner as it certainly should be understood and insisting that not only a feeling of brotherly love should exist between us as organizations, but as individuals as well. He closed, leaving impressions on our memories that we will cherish amongst our most pleasant recollections. He showed that by working together (for we both have the same objects in view which we could thus attain so much easier) success would crown our efforts where, when divided, we have sometimes met with failure. Several other speakers added their sentiments to what had already been said, thus, aiding that spirit of peace, harmony and co-operation which pervaded the gathering. Some very pleasant things were said and, taken altogether, we consider the meeting a most successful one, and I don't think there was one single member of all who were present that was not pleased and benefitted.

Now, brothers, both engineers and firemen, consider well this example and profit thereby. I hope it will appeal to each and every one and make better Brotherhood men of all of us.

MEMBER, Lodge 646.

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Look Out for Him.

During the month of October, 1908, W. H. McKee, of Lodge 220, Sunbury, Pa., came West and landed in Indianapolis. He secured a position on the C., H. & D. R. R. as fireman, between Indianapolis, Ind., and Hamilton, Ohio. One of the members of this lodge who is working on that road with headquarters at Indianapolis stood good for his board bill, gave him money to buy clothes with and in many ways assisted him, as he seemed to be in very hard luck. Instead of settling his bills like a true Brotherhood man, McKee skipped out last January and has not been heard from since. He stated to some one that he intended going to Ft. Worth, Texas. This, however, was probably an untruth on his part and he is likely to be found in some other part of the country. He not only left owing the brother of this lodge, but also owed room rent and board bill in other quarters. McKee is a man of about 35 years of age; is about 5 feet and 8 inches tall; weighs about 160 pounds; has brown hair and eyes; is bald. As he will no doubt continue to carry on his dishonest operations in some other State, all Brotherhood men should be on the lookout for him.

L. M. TRIMBLE,
President Lodge 269.
CHAS. BAUMHECKEL,
Recording Secretary Lodge 269.

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Beware of Him.

Jesse W. Griggs was expelled from Holbrook Lodge 378 for non-payment of dues. He left here (McKees Rocks, Pa.) some time during 1908. When last heard of he was passing himself off as a Brotherhood man to members of Fleetwood Lodge 424 at Covington, Ky. He obtained employment on the C. & O. R. R., but was laid off before making a trip and left there leaving numerous bills for good brothers to settle.

Griggs is about five feet ten inches in height: weighs about 150 pounds; has light hair, which he wears parted in the middle, and is a very smooth talker. He is no good to himself or family. All honest Brotherhood men should beware of him.

CHAS. E. DAVIS,
President Lodge 378.
THOMAS MITCHELL,
Secretary Lodge 378.

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Shuckin' Corn.

Oh, it's get up in the mornin',
At the early hour of four;
When a feller'd give a fortune
For another hour to snore,
And the cook out in the kitchen
Is a-settin' breakfast on,
And a-listenin' to the music
Of the steamin' kettle's song.
And it's eat the eggs and bacon
Gravy spread on home-made bread;
Then it's push back in a hurry,
'Cause the sky's a-gettin' red,
And the hired man's done a-milkin',
And the shoats have just been fed;
And the turkeys from the tree tops
To the corn cribs have all soared,
When we hear the corn a-knockin'
On the Old Bump Board.

Oh, the air is keen and frosty,
And it makes our faces glow;
And the crystals keep a-sailin',
Makes one think it's spittin' snow.
Oh, it's pop your heels together,
And it's swing your arms around;
And it's blow upon your fingers,
And our ears the cold has found;
For the frost is on the shucks,
And the freeze is in the ground,
And the apples and the punkins
In the cellar have been stored,
When you hear the corn a-knockin'
On the Old Bump Board.

Oh, the days so soft and hazy,
Though the mornin's are so cold;
Oh, they make a feller lazy—
If the truth must all be told—
When he eats a hearty dinner,
And must hurry back agin,
And start right in a-shuckin',
To a boy it's just a sin;
For the squirrels and droppin' nuts
Are now surely callin' him
To the woods, where Mother Nature
Has her autumn treasures poured,
When you hear the corn a-knockin'
On the Old Bump Board.

—J. L. Warden in Indianapolis News.

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"It Is Heart That Wins."

BY ADELBERT CLARK.

It is heart that wins,
The round world over;
It is heart that wins
And not the head.
For 'tis Love that counts
And lives forever,
When all things crumble
And pride is dead.

It is heart that wins,
In spite of Hades;
It is heart that wins
God's righteous plan.
For Love is of God
And God is King,
Maker of Heaven
And earth and man.

It is heart that wins
The fallen brother;
It is heart that wins
And brings him back.
It is Love that gives
A cheery welcome—
Looses his sandals—
Removes his pack.

It is heart that wins
The broken spirit;
It is heart that wins
When life seems dead.
For 'tis Love that charms
While healing sorrow,
And clears the storm-clouds
From overhead.

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Correspondence

LODGE 184—(*A. E. Ransbottom, Lima, Ohio.*) We have a fine lodge here on the C., H. & D. System. Work is just fairly good. We are taking in new members right along, being about ninety-six per cent. organized. We have a good hustler for our local chairman. He has always got his eyes open for the betterment of the Brotherhood. A Ladies Society was organized here last June and we held our first joint meeting on March 24th, which was a splendid success. Our door is always unlocked and all brothers in good standing who give us a call will receive a hearty welcome.

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LODGE 217—(*N. E. Windsor, East St. Louis, Ill.*) Since you have heard from us through the columns of the Magazine there have been some changes, whether for better or for worse remains to be seen. The changes which have been made in our Grand Lodge officers seems to have caused but little difference in the way of doing things. We hear of no complaint from others, so I presume their service is satisfactory. The other change is at the head of our great nation. Whether it will be a prosperous and business benefit to all the Brotherhoods is as yet unknown—we can only wait and hope for the best.

The board of directors at its annual meeting has put before us a proposition (which was referred to them by the Eleventh Biennial convention) to vote on the establishment of a new department known as the "Accident Indemnity Department of the Brotherhood of Locomotive Firemen and Enginemen." A great many brothers have made inquiries concerning this department and some think that it will be compulsory with every brother if this should become a law. This is not the case, if I understand the law correctly. It is not compulsory with any one to take out this insurance unless he so desires. If a member thinks this insurance is a good move he should vote for it; if not, vote against it—but vote one way or the other.

Business is very poor through our section of the country at present, but a great many people think it will soon be better now owing to the revision of the tariff, which is likely to cause some change in business conditions.

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LODGE 382—(*Virgil A. Taylor, Gibtown, Texas.*) Business is very dull here at present, and a great many of our young runners are back on the left side. We have a fine bunch of boys, but they do not attend lodge meetings as they should. Most of the engineers in this part of the country are very good, although some of them seem to forget the time when they wielded the scoop. I am laid off at present, but go to lodge meetings when possible.

I think the monthly payment plan is very good, but we all should pay from three to six months in advance, for we may have hard luck at any time. I also think that shortening the time from nine to six months for a fireman to fire before being admitted to our Brotherhood is a good thing, as very few men would fire unless they intended to become engineers. We meet every Wednesday evening at 7:30 and visiting brothers are always welcome.

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LODGE 578—(*Member, Louisville, Ky.*) We are still living and doing business at the old stand. We have two good, strong lodges (Nos. 502 and 578) at Louisville, and outside of the fact that business is dull on the roads we cannot complain. Both lodges have over 100 members each and are adding a few new members now and then. Recently we had a visit from our Southeastern organizer, Bro. W. Slaby. His visit has done us much good, as he gave the boys the benefit of his experience and investigation in the Southern States and pointed out to them where they were not living up to their obligations. There is plenty of new material to work on in this part of the country, and as the L. & N. R. R. is still persecuting our members it is our duty to make the Order as strong as possible on all competing lines, so that we can do in the future as we have done in the past and be able to take care of all of our members who happen to be discharged on account of joining our Order. Then after awhile these people may get tired of furnishing experienced men for other railroads. After a man has fired long enough to join our Brotherhood he is able to fire a locomotive on any road.

Now I would say to the boys in this section of the country, do not forget Brother Slaby's advice; put it into practice at once and keep it going. You will find that all the lodges will grow in membership and fraternal spirit and can demonstrate to organized labor in general that the South is not only God's country, but in spite of the panic and persecution we still have a good many of God's people enlisted in the grand old B. of L. F. and E., and with the assistance and advice of such men as Brother Slaby we will yet make the "Sunny Southland" what it once was to our Brotherhood, viz., the best organized section in the United States for the men who fire locomotives south of the Ohio River.

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LODGE 148—(*Daniel Fogarty, Tyler, Texas.*) I have been a member of our grand old Brotherhood for twenty-four years, and this is my first attempt to write a letter for our Magazine.

I have received the full amount of my insurance which was allowed by the Eleventh Biennial Convention, and it is impossible for me to express my heartfelt gratitude to the officers and delegates who composed that body. I would like to take each of you by the hand and in my feeble way tell you how I appreciate the kindness you have bestowed on me. Brothers, my wife and I thank you from the bottom of our hearts for what you have done for us, and while we are both getting old and will not be with you many more years, still, so long as the Heavenly Master spares our lives our hearts will be overflowing with love for our grand old Brotherhood. I am investing every dollar of my insurance in two small houses, the rent of which will keep us as long as we live. I feel that I have been paid ten dollars for every one I have paid to the Brotherhood.

I cannot express in words how grateful I feel towards the members of our organization as a whole, and especially those who accompanied me to the convention. To Bro. K. W. McDonald and wife, Bro. J. W. Bain and wife, Bros. C. Herrin, W. J. Beard and M. D. Waller of 548 I feel under lasting obligations.

My wife joins with me in wishing you one and all God's choicest blessings.

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LODGE 271—(*Wm. Weiler, Port Morris, N. J.*) I wish it were possible for me to put a quietus on those who desire to kick on the "best thing out" in the line of insurance. Ever since I have been a member it has always been a surprise to me that our insurance cost us so little, and I have naturally expected the rates would increase as our Order grew older. But, fortunately, a number of our bad risks joined the Brotherhood of Locomotive Engineers in time for that organization to pay their beneficiary claims and thus save us the expense.

For years I have advocated the idea of paying more than the cost of defraying the expense incurred on account of death and disability claims, but I must admit that my efforts were not very productive of results. I am still of the opinion, however, that if our Order had created a reserve fund years ago, which would have naturally increased, due to the interest on the principal, it would have been a move in the right direction.

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LODGE 262—(*Member, West Toronto, Ont.*) We are having a poor time of it just now, owing to the general business depression. We have had forty firemen and quite a number of engineers laid off. A change of staff has taken place here which promises to be beneficial to all concerned. I may say that our engines are already beginning to show a great improvement. There is, however, a great deal of room for improvement in the quality of the coal that we are being supplied with. We had the company's air car here recently and I have no doubt that everybody going through it derived a great amount of information about the ET equipment. We have quite a number of applications for membership in our grand old Order, but until things pick up we ought to be satisfied to wait for the prospective members. No matter how dull times are, it does not seem to have any effect on the attendance, which I may say is usually small. As our membership is near the hundred and ninety mark we ought to have good meetings. I notice, too, that members who stay away are just the ones who do the kicking if anything is done that does not meet with their approval. I trust that our brothers will indorse the accident clause.

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LODGE 335—(*Member, Montreal, Quebec.*) The outlook in this section points to a busy summer season, with prospects of an increase in membership of this lodge, the material already being in sight. We are hearing but few complaints from the members on the new system of collecting dues. On the whole they seem to consider it an improvement on the old method. However, the financial secretary considers the position no picnic, as he has resigned, making the election of a successor necessary. I regret to state that a number of the active members of a sister lodge in this city have been so unfortunate as to lose their positions; this coming, too, from the other side of the cab which they had worked so hard to reach.

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LODGE 111—(*D. O. Watson, Mattoon, Ill.*) On March 17th we took in six new members and expect quite a good many more in the near future. Our lodge is prospering and it looks now as though our membership list will continue to grow rapidly. The new members just added will make excellent Brotherhood men and their efforts, coupled with those of our old members, will surely count in making Beacon Lodge one of the foremost in Brotherhood affairs.

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LODGE 538—(*H. C. Wickliffe, South Chicago, Ill.*) After having met with a very severe financial strain recently I am pleased to say that Gladstone Lodge 538 is again square with the world, and is also the possessor of a bank book which shows that we have a small amount of money deposited where it is safe. Our officers are doing excellent work and they are receiving great help from the members in general. I only wish the whole membership at large could have been at a special meeting which we held recently for the purpose of devising ways and means to keep our dear old lodge from losing its charter on account of not being able to pay our quarterly assessment. Brothers, it would have done your hearts good to have witnessed the eagerness which some of the members displayed in producing their pocketbooks, and loaning the lodge the money which was required to put us on a safe and sound basis. One of the brothers who loaned $25.00 had only been a member a couple of months.

I am very sorry to say that our worthy president met with an accident a few days ago which nearly cost him his life. I am glad to say he is now on the road to recovery and we expect to see him in his old place in a short time.

We now have about twenty switch engines working in the new steel mills at Gary, Ind., and about six work trains and fifteen road engines. As a whole we have a very nice set of officials on the C., L. S. & E. Railway, especially our master mechanic. We very seldom are forced to go to any other official to adjust our grievances, as he is very square in his decisions.

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LODGE 611—(*Member, Alpena, Mich.*) Times are quite dull here at present, but prospects for the future look better. R. C. Simmons, Lodge 611, has a bunch of boys who don't get discouraged. They turn out at every meeting and talk of better times coming. We have about sixty members, with nearly as many engineers as firemen, and we hope in a few months to gather in those who have so far failed to get within the ranks of the "Tried and True." Our engineers are all staying with us, and are among the best workers for the Order. We have pretty good engines, a fairly good grade of coal, and our runs are not too long. No one can attend to our grievances better than Bros. Martin, Campbell and Gardner. I am glad to read of the good headway other lodges are making. I hope they will continue their good work and make our great Brotherhood the strongest organization of its kind in the world.

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LODGE 145—(*E. G. Forster, San Antonio, Texas.*) By the smokes! Say, fellows (brothers) I have been trying to figure out as to what became of "Echoes from the Firing Line."

(For want of material this department was left out of the February and March numbers of the Magazine.—EDITOR.)

I have a fond remembrance of same when a whole tribe of tallow-pots were just crawling, sprawling and falling all over one lonely, intelligent M. M. just because he made a bluster. But I assure you, brothers, that I am not desirous of again arousing your ire on that subject, nor the M. M.'s either, but noticing you've quit going after him I thought I'd argue a little. Now, while we're talking, I can't see why we should let the "Echoes" off the line—die out—as there are all sorts of subjects we might have to keep it alive, and in our Correspondence Department the subject of how to get the boys to attend meetings more regularly, or how to keep them interested is a topic itself which isn't so small when one comes to figuring the "ways and means." My interest in wanting to keep the "Echoes" on the move may seem a little strange; but she needs a trifle more fire. For instance, when a fellow in reading the Magazine is all frazzled up studying technicalities until he is blue in the face, he turns the page to see something on "No Such Thing as Poor Coal," or whatever subjects may be up for discussion. It goes without saying that some one from some place will "hit the ball" somewhere on the pike, and, of course, it will be the "Hall of Fame" for his.

Not long ago in the Magazine I noticed where our worthy international President gave us the "easy sign" in regard to our accident carrying policy proposition. That's all right, too, but there are two sides to look at. No doubt it will be rough hoeing, so to speak, for awhile until the boys all get lined up, and then things will have to come our way. I note these insurance companies are successful and they have to pay a number of high-salaried agents (which we won't need). They may be good, and why can't we be? We can try.

There is nothing doing in the railroad line around Texas at present, only figuring as to what happened to last year's wages.

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LODGE 670—(*D. A. Grimsley, Salt Lake City, Utah.*) On November 1st I came to Salt Lake City from Old Mexico, took a position on the D. & R. Ry. and started to work, but also lost no time in doing what I could for our Brotherhood. This division has about 450 miles of territory and 225 firemen. Of these there were 112 B. of L. F. and E. members in Lodge 670. We got busy, and since the first of the year we have raised the membership from 112 to 153 and have 47 applications that have been accepted and are awaiting their turn to be initiated. We are going to have 200 members in Rio Grande Lodge 670 by June 1st next. We are holding all of our engineer members and, as a body, think our lot as strong as any. Our Ladies Society here is supported by the ablest and most womanly of the ladies that hold their banners for our comfort, and our boys are proud of the many courtesies that they bestow upon us.

Now, brothers, let all of us see if we can get together and each lodge do as well as Rio Grande. Let us show our colors and then boast of what we have done afterwards, and in a short time our army will be 100,000 strong—the strongest labor organization in existence. A little time, patience and earnestness from each one of us will build this great fortification of ours up to a comparison with the "Rock of Gibraltar." Myself and the other members of 670 take pleasure in boasting of its success and that of the L. S., which shares our sorrows and cheers us up in time of trouble, and always has a helping hand to give us. How many other lodges are doing the new work that we are? Ask yourselves this question and then see if you cannot excel us. Will conclude by saying that all our members read the Magazine and would like to hear from other lodges as to what they are doing. We extend our hearty wishes to all our craft.

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LODGE 204—(*C. F. Browning, Jonesboro, Ark.*) I have been a member of our noble order for three and one-half years, and as I have failed to notice any item from our good old lodge I would like to let the readers know that we are still wide-awake and on the move. I fear that some of our members in distant parts of this vast continent will get the idea that we are at a standstill, or even worse. With trembling hands I write to assure our membership that we are very wide-awake and hustling. More than that, our efforts are being attended with success, for we are steadily prospering, both numerically and financially. We believe that we have one of the best lodges in the Southwest at the present time. We have a membership of 120 members and still have more new members coming in. All the brothers seem to pride themselves in securing new candidates, as we don't believe it is a good policy to allow our goat to be idle too long, as he would become unruly. At the present time business is .kind of dull, although I don't feel that the brothers have much room for complaint, as traffic has been fairly good throughout the entire panic. Prospects now seem to us to be favorable for the near future. The company has purchased new motive power, and it is being delivered at the present time. We understand that they have 31 new Baldwin engines and have given the contract for 30 new passenger coaches. This all goes to prove that prospects in the future are bright for us on the Cotton Belt.

I wish to state to the entire Brotherhood that I believe we have one of the best lodges in the West, and if you will only give us an opportunity we will show you. All we ask of you is to just give us a call. Our doors are always open to visiting brothers and hearty welcome awaits you within.

Now, wake up, brothers! Get the ball rolling and create a desire to have large meetings in lodge rooms. Attend the meetings and get wise to the good work of a great order. Let us work together and make the B. of L. F. and E. one of the grandest labor organizations in existence.

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LODGE 548—(*J. H. Wallace, Commerce, Texas.*) We are still in the ring and are taking in new members every now and then. Business is fine and some of the fire boys are making a few trips on the right side of the cab. We are getting a new engine every once in awhile. They have doors with air openers and have rather large cylinders, 20x28. We are getting only fairly good coal. We have some of the nicest officers to work for that can be found on any road, and if we have to go a long trip we try to endure it cheerfully. I am proud to say 548 has a live set of officers, and members as well. Our chairman is going to Chicago to meet the Federated Board. We have a chairman we can rely upon. Lodge 548 is now in pretty good shape. We meet every Saturday night at 8 p. m. in the K. of P. Hall. All brothers coming this way are invited to attend. We have as good a set of engineers to work with as could be found anywhere. We always have good attendance at our meetings and all seem to take an interest in the work of the lodge. We look forward to the monthly visits of our Magazine, taking especial interest in the Correspondence Department, also in the Train Rules Department, and are proud of the fact that we have such a good Editor.

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LODGE 270—(*James W. Sperbeck, Minneapolis, Minn.*) We are steadily climbing the ladder of uprightness in a manly, straightforward manner. Our lodge is the largest one in the Twin Cities. Our membership runs close to 190 and we still have plenty of valuable material to work on. Some of the nonunion firemen are a little slow about getting "into clear." However, we are doing our best to get them to join our grand old Order, and usually have from one to three candidates at each meeting. About one-half of our membership has been promoted to the right side, but still remain with the old "Tried and True." The working conditions here on the river division of the Chicago, Milwaukee & St. Paul are good. We have the large Baldwin compound engines in our passenger service and the large American piston valve engines in freight service. We have a fair grade of coal and most of the men are satisfied.

Just a few words on the Accident Indemnity Department. I think this is a good thing, and the best link in the endless chain, as our Order ought to handle this and furnish us such protection cheaper than we can get it from other insurance companies.

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LODGE 764—(*Member, Ludlow, Ky.*) We are back at the old stand doing business again. Old Kentuck Lodge 764 was organized at Ludlow, Ky., on April 4th last by Third Vice-President A. P. Kelly, who was ably assisted by Bros. J. P. Perry, president of Fleetwood Lodge 424, and C. Baumheckel of O. K. Lodge 269. The new lodge was instituted with eighteen charter members, and we look to swell this number at our next regular meeting, as we already have a good many applicants, and we hope to succeed better with this lodge than with the old one, as the members seem to take a great deal of interest and are putting forth every effort to make Old Kentuck a success.

Business is very good here at present and prospects for a continuance are very bright, which will give us a great deal of timber to work on.

Those Overalls of Blue.

You ask me why I keep them,
  Those old overalls of blue;
When there's no one here to wear them?
  Ah; yes, child, 'tis very true.

They are old and faded now,
  But to me they're very dear;
They're reminders of the husband
  Who was with me one short year.

In the corner they are hanging,
  Over by the kitchen door,
Where he hung them every evening—
  But he'll never wear them more.

For he left one sunny morning
  On his engine, blithe and gay,
And they brought him home at evening—
  But his soul had passed away.

'Twas the bravest deed on record,
  So they told me when they came,
How he'd saved from death the people,
  Who were riding on the train.

But I cared not for the glory,
  And the world seemed not the same,
For he never more would answer
  When I fondly called his name.

Though the whistle of the engines,
  Passing swiftly on their way,
Bring me only pain and sadness,
  Still I listen every day.

And I keep the old suit hanging,
  Over by the kitchen door,
Just because 'twas there he hung it
  In the days that are no more.

And in loneliness I'm waiting,
  As the days go slowly by,
For the time when I shall meet him
  In his home beyond the sky.
For he gave his life for others,
  So I know I'll find him there,
And I'm sure he will be waiting,
  Waiting at the golden stair.

Jennie M. White.

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If.

If we could always be as kind
As when some grief has scourged our
    mind;
As gentle as when love is king,
'Twould teach this sad old world to sing,
'Twould prove beyond a doubt, each day,
That kindness is the better way.

If we could always see the good
In erring brother as we should,
And close our lips when wont to speak
Of error in the poor and weak,
I think that we would soon be glad
And see more good in man than bad.

The hearts of men need sun and light,
And words to cheer them in the night.
A virtue praised, a cheerful smile,
Would rob their tempter of his guile;
Would teach the good in them to grow,
And baffle wrecking undertow.

I'm sure that being just is best,
That charity is always blest,
That gentle judgment, words of cheer,
Have often stayed a springing tear.
Seek ye in every man the spring
That longs to ripple and to sing.

And all thy charity and grace
Will shine as gladness in thy face,
And doubly in thy heart will bloom
To fill thy life with sweet perfume—
'Tis written in the Book of Seers
That he who makes the music hears.

W. H. Rorabaugh,
Lodge 343.

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Official

Addresses Wanted.

Persons requiring the address of or any information concerning another will please communicate with the secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the secretary of such lodge, requesting that a notice be published in the Magazine inquiring for such address or other information, same will be complied with. However, the Magazine can not undertake the office of a collecting agency, and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the person specified in the notice:

John Albert Monahan.—When last heard of was at Perry, Iowa. He is five feet three inches tall, weighs one hundred and fifty pounds, and has light blue eyes and auburn hair. Any one knowing of his whereabouts will please notify A. H. Pearson of Lodge 188, B. of L. F. and E., at 857 Cornelia street, Chicago, Ill., who has important tidings for him.

John J. Leahy.—Formerly a fireman on the C. & O. Railway and the C., H. & D. Railway. Any one knowing his whereabouts will please furnish his address to Chas. Baumheckel, recording secretary, Lodge 269, B. of L. F. and E., 523 Elm street, Cincinnati, Ohio.

R. R. Farlow.—Member of Lodge 603. Has not been heard of since December, 1908, when he was at Culiacan, Sinaloa, Mexico. He is stout of build; has black hair and brown eyes. His aged mother is very anxious to learn of his whereabouts. Any one knowing his present address will please correspond with Otis Embry, recording secretary, Lodge 603, B. of L. F. and E., 923 Williams street, Sherman, Texas.

W. K. Smith.—Last heard from he was working for Etter & Co., on a railroad bridge at Towanda, Pa. Has not been heard from for a year. His mother is very anxious to locate him, as she is in possession of information which will be to his advantage. Was formerly a member of a lodge in Pittsburg and Lodge 23, Scranton, Pa. Anyone knowing his present address or in possession of any information at all regarding him will please correspond with Mrs. J. J. Smith, R. F. D. No. 4, Box 88, New Bethlehem, Pa.

John Stheel.—Pronounced "Steel." He married a young lady in Lafayette, Ind., about 1902 or 1903. Anyone knowing his address or in possession of any information regarding him will please correspond with his old friend, B. C. Hopkins, care Prospect Street Y. M. C. A., Cleveland, Ohio, as he is very anxious to locate Mr. Stheel.

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Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Pocket bill book containing traveling card, also K. of P. receipt dated for this year, belonging to T. F. Somers, member of Lodge 281, B. of L. F. and E., were lost on March 22d in Sandusky, Ohio. If found please return to T. F. Somers, care S. A. A. P. roundhouse, Yoakum, Texas.

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Acknowledgments.

Mr. and Mrs. Coombs, of Little Rock, Ark., desire to thank the Brotherhood of Locomotive Firemen and Enginemen for the many kindnesses shown them by the members of Lodges 304, 515 and 45, and for the valuable assistance rendered in caring for the remains of their son, Brother J. L. Coombs, of Lodge 304, who lost his life at El Reno, Okla.

Sister Minna A. Britton, of Longview, Texas, whose heart is filled with gratitude to the Brotherhood of Locomotive Firemen and Enginemen, desires to thank the members of our order for their many kind words of sympathy and condolence, as well as substantial acts of kindness, tendered her during the late illness and death of her husband, Bro. W. H. Britton, of Lodge 70. She also wishes to thank the Grand Lodge for the prompt payment of claim.

Bro. E. G. Fisher, of Lodge 508, desires to thank the officers and members of Wayne Lodge 508 for the many kindnesses extended to him. He also wishes to thank the Grand Lodge for the prompt payment of his disabality claim.

Bro. J. L. Madden, of Lodge 401, wishes to thank the members of his lodge for the assistance given him during the last year, and also desires to thank the Grand Lodge for the prompt payment of his claim which was allowed by the Eleventh Biennial Convention.

Mr. and Mrs. Wm. P. Broadwell, of Ludlow, Cal., desire to thank the Brotherhood in general, and the officers and members of Silver Mountain Lodge 327 in particular, for the many kindnesses shown them in their sad bereavement occasioned by the loss of their only son, Bro. Herbet C. Broadwell, by a wreck on the Tonapah and Tidewater Railroad August 8, 1908.

Bro. Charles Clausen, of Bonanza Lodge 194, wishes to thank the Brotherhood of Locomotive Firemen and Enginemen for their kindness in allowing him payment of his disability claim at the Eleventh Biennial Convention. He also wishes to thank the members and officers of No. 194 and Golden Gate Lodge 91 for their kindness to him and his family during his suffering from injuries sustained June 21, 1908, as well as the members of Silver Mountain Lodge 327 and Orange Grove Lodge 97 for the kindness shown him when he was injured a few years ago. He earnestly wishes the officers and members of the B. of L. F. and E. great success and prosperity.

Bro. J. P. Ryan, financial secretary of Lodge 685, and Sister Ryan desire to thank the members of Lodge 685 for their great kindness to them during Brother Ryan's illness (he being still very sick and unable to work). Sister Ryan also wishes to thank the members of No. 685 for the elegant water-power washing machine which they sent her. Both Brother and Sister Ryan wish the members of Indiana Harbor Lodge, as well as the officers of the B. of L. F. and E., the fullest measure of success and prosperity.

The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of March, 1909:

B. of L. F. and E. Lodge 224..	$10 00
O. R. C. Divisions............	1,153 00
B. of R. T. Lodges...........	717 15
B. of L. E. Divisions.........	980 25
L. A. C. Divisions............	10 00
G. I. A. Divisions............	10 00
L. A. T. Lodges..............	22 25
James Costello, Division 270, O. R. C.	1 00
Alfred S. Lunt, Lodge 456, B. of R. T.	1 00
F. S. Barnes, Lodge 28, B. of R. T.	1 00
J. McQuaid, Lodge 39, B. of L. F. and E..................	1 00
W. J. Van Hess, Division 193, B. of L. E................	3 00
Interest on deposit at Cleveland, Ohio	191 00
Interest on deposit at Clinton, Iowa	123 20
From members of Lodge 369, B. of R. T................	27 00
From members of Division 606, B. of L. E................	17 00
Proceeds of a ball given by Lodge 115, B. of R. T......	65 00
O. P. Case, Division 508, O. R. C.	1 00
J. C. Collins, Division 508, O. R. C.	1 00
S. S. Beaty, Lodge 717, B. of R. T.	25
T. S. Williams, Lodge 307, B. of R. T.................	25
Leon Belisle, Lodge 233, B. of of R. T..................	50
From members of Division 643, B. of L. E................	10 25
Total	$3,346 10

Miscellaneous.—One quilt from Division 373, L. A. T.; 3 cans of fruit from Mrs. L. W. Woodmansee.

Respectfully submitted,

JOHN O'KEEFE,

Sec. and Treas. R. R. M. H.

Beneficiary Statement

OFFICE OF GENERAL SECRETARY AND TREASURER,
PEORIA, ILL., April 1, 1909.

TO SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of March, 1909:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1		77		153		229	310 00	305	3 00	381		457		533		609		685	152 50
2		78		154	4 50	230	493 75	306		382	156 75	458		534	295 75	610		686	
3		79		155		231		307		383		459		535		611		687	
4	314 75	80	216 75	156	261 75	232		308		384		460	99 00	536		612		688	
5	318 50	81		157		233		309	331 00	385		461		537		613		689	
6		82		158		234	1 50	310		386		462		538		614		690	
7		83		159		235		311		387		463		539		615		691	
8	3 00	84	2 25	160	2 25	236		312		388		464		540		616	73 50	692	
9		85	321 25	161		237		313		389		465	1 50	541		617		693	
10		86	4 50	162		238		314	210 50	390		466		542	9 00	618	186 25	694	105 00
11		87		163		239		315		391	1 50	467		543		619	94 50	695	
12		88	21 75	164		240	2 25	316	5 25	392	1 50	468		544		620		696	
13		89		165		241	295 75	317	4 50	393		469		545		621		697	
14		90		166		242		318	4 50	394		470		546		622		698	
15		91		167		243		319	150 75	395		471		547		623	131 00	699	
16		92		168		244		320	51 75	396		472		548		624		700	
17		93		169		245	298 75	321		397		473		549		625	184 50	701	
18		94		170	269 75	246	253 50	322		398		474		550	8 25	626		702	208 00
19		95		171		247		323		399	119 25	475		551		627		703	
20		96		172		248	275 75	324		400	151 00	476		552		628		704	
21		97		173		249		325		401	1 50	477	6 00	553		629		705	84 00
22		98	254 50	174		250		326		402	2 25	478	149 25	554		630		706	
23		99		175		251		327		403		479		555		631		707	
24		100		176		252		328		404		480		556		632		708	
25		101	2 25	177		253		329	68 25	405		481	4 50	557		633	137 25	709	
26		102		178		254		330		406		482		558		634		710	
27		103		179		255	3 75	331		407	4 50	483	75 00	559		635		711	
28		104		180		256	82 75	332	4 00	408		484		560		636		712	
29		105		181		257		333		409	238 75	485		561		637		713	
30		106		182		258		334		410		486		562		638		714	
31		107		183		259		335		411		487	25 50	563		639		715	
32		108		184		260		336		412		488		564	6 75	640		716	
33	180 25	109		185		261		337	14 00	413		489	166 50	565		641		717	
34	221 50	110		186	33 75	262		338		414	135 75	490		566		642	2 25	718	
35		111		187		263		339	207 00	415		491		567		643		719	
36		112		188		264		340		416		492	15 00	568		644		720	
37	2 25	113	6 75	189	266 50	265		341		417		493		569		645		721	
38		114	60 00	190		266		342		418	210 75	494	6 00	570		646		722	
39		115		191	438 75	267		343		419		495		571		647		723	
40		116		192	361 25	268		344		420	97 50	496		572		648		724	71 50
41	55 50	117		193		269	141 75	345	243 75	421	3 75	497	3 75	573	262 75	649		725	
42		118		194		270		346		422	75	498		574		650		726	
43	177 75	119		195		271		347		423		499		575		651		727	
44		120		196		272		348		424		500		576		652		728	75 00
45	529 50	121	294 00	197		273		349		425		501		577		653		729	
46		122		198		274		350	3 00	426	299 50	502		578		654		730	
47		123	281 25	199		275		351		427	3 00	503	75	579	64 75	655	56 50	731	
48		124		200		276		352		428		504		580		656	4 50	732	51 25
49		125		201		277		353		429		505		581	75	657		733	
50	2 25	126		202		278		354		430		506		582		658		734	
51		127		203	283 00	279	94 75	355		431		507		583	106 50	659		735	
52		128		204		280		356		432		508		584		660		736	
53		129		205		281		357		433		509		585		661	3 00	737	
54		130	9 00	206		282		358	2 25	434	31 50	510		586	42 00	662	60 25	738	
55		131		207		283		359		435		511		587		663		739	
56		132		208	85 50	284		360		436		512		588		664	3 00	740	2 25
57		133	309 25	209		285	359 25	361		437		513		589		665		741	
58	227 50	134		210		286		362		438		514	138 00	590		666	271 50	742	
59		135		211		287		363		439		515		591		667		743	
60		136	1 50	212	3 00	288	118 50	364		440		516		592		668		744	19 50
61		137		213		289		365		441	195 50	517		593		669		745	
62		138		214	1 50	290		366	82 50	442	4 50	518	36 00	594		670		746	
63	1 50	139	362 00	215		291		367		443		519		595		671		747	
64	75	140		216		292		368		444	4 50	520		596		672		748	2 25
65		141		217		293	161 50	369	2 25	445		521		597	206 50	673		749	3 00
66		142		218		294		370		446		522		598		674		750	
67		143	476 75	219		295		371		447		523		599		675		751	49 50
68	124 00	144		220		296		372		448		524		600		676		752	
69	84 75	145	232 25	221		297		373		449		525		601		677		753	
70		146	257 50	222		298		374	3 00	450	4 50	526		602		678	6 00	754	
71		147		223	240 75	299		375		451		527		603		679	129 50	755	
72		148		224		300		376		452		528		604	137 50	680		756	
73	16 50	149		225		301		377		453		529		605	148 25	681		757	
74	197 25	150		226		302		378		454	4 50	530		606	75	682	89 75	758	
75		151		227		303		379		455	139 00	531		607		683		759	
76		152		228		304	244 50	380	1 50	456	159 25	532		608		684	63 50	760	

Received during month of March $18,722.00

Respectfully submitted,
A. H. HAWLEY, G. S. and T.

Statement of Death and Disability Claims

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM FEBRUARY 28, 1909, TO MARCH 31, 1909.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
1469	Norris B. Butler........	571	Death.....	Oct. 26, 1908	$ 500	Crushed between cars.
1494	Elmer M. Willard....	51	"	Nov. 21, "	1,500	Paralysis.
1510	John W. Riley........	430	Disability	Feb. 1, 1909	1,500	Blind in one eye.
1533	Alma A. Peterson....	19	Death.....	Dec. 17, 1908	1,500	Typhoid fever.
84	Herbert P. Ransom..	409	"	Jan. 6, 1909	1,500	Run over by train.
1528	Edgar McKeough.....	520	Disability	Feb. 22, "	500	Consumption of lungs.
1501	Frank D. Chapman..	64	Death.....	Nov. 26, 1908	3,000	Suicide.
1476	William Pearse.......	429	"	" 15, "	1,500	Consumption of lungs.
1488	Peter H. Righter.....	656	"	" 17, "	1,500	Derailing of engine.
20	George H. Ritchey...	262	Disability	Jan. 13, 1909	1,500	Locomotor ataxia.
43	James G. Hadden....	381	Death	" 10, "	500	Typhoid fever.
44	Hary C. Buell.........	84	"	" 16, "	1,500	Typhoid fever.
48	Edwin Stuart.........	501	"	" 7, "	1,500	Derailing of engine.
49	Edward G. Fisher....	508	Disability	" 12, "	1,000	Amputation of foot.
53	Ed. M. Dufur.........	409	"	" 3, "	1,500	Amputation of foot.
56	John B. Heaton......	447	"	" 10, "	1,500	Amputation of hand.
57	Norman G. Fish......	33	Death	" 16, "	500	Run over by train.
58	Wm. J. Johnson......	4	"	" 18, "	1,500	Heart disease.
62	Chas. A. Russell.....	562	"	" 12, "	1,500	Pneumonia.
64	John D. King.........	342	"	" 13, "	2,000	Collision.
68	Alexander S. Redden.	319	"	" 21, "	500	Struck by engine.
72	Jesse T. Berry........	28	"	" 26, "	500	Derailing of engine.
73	Edward L. Longacre..	386	"	" 26, "	1,500	Uremic poisoning.
76	W. H. Britton.........	70	"	" 25, "	1,500	Pneumonia.
77	Wesley P. Surrett....	551	"	" 30, "	1,500	Gun shot wound.
78	James W. Walsh.....	10	"	" 16, "	3,000	Paresis.
79	Volney Cronk.........	149	"	" 27, "	1,500	Struck by derrick.
81	Walter A. Wiggin....	485	"	" 11, "	1,500	Pneumonia.
83	James White..........	241	"	" 29, "	1,500	Heart disease.
85	Chas. H. Donelson...	568	"	" 14, "	1,500	Overcome by gas.
87	Frederick J. Closser.	326	"	" 9, "	1,500	Typhoid fever.
89	Thamas Connors.....	100	"	" 29, "	1,500	Falling from engine.
90	Alford B. Carroll.....	70	"	Feb. 1, "	1,500	Blood poisoning.
93	Willis C. Walter......	266	"	Jan. 23, "	1,500	Pneumonia.
96	John Cooper..........	117	"	Feb. 7, "	1,500	Falling from engine.
97	Lloyd W. Weaver.....	501	"	Jan. 9, "	1,000	Gunshot wound.
102	Merle A. Champion..	485	"	" 30, "	1,500	Consumption of lungs.
103	George H. Whistler..	34	"	Feb. 5, "	1,500	Addison's disease.
104	John H. Kett..........	540	Disability	Jan. 23, "	1,500	Amputation of feet.
106	Albert E. McLeod....	475	Death.....	Feb. 8, "	1,500	Derailing of engine.
107	Maurmer Root........	181	"	Jan. 27, "	1,000	Collision.
108	Patrick J. Kelly......	543	"	Feb. 2, "	1,500	Heart disease.
110	William Curran.......	3	"	" 8, "	1,500	Apoplexy.
948	Frank Brady..........	8	"	Mar. 2, 1908	500	Heart disease.
1526	Roy Reynolds.........	97	"	Dec. 12. "	1,500	Boiler explosion.
86	H. M. Montgomery...	220	"	Feb. 2, 1909	1,500	Hemorrhage of brain.
88	Thos. F. Burgan ...	318	"	Jan. 29, "	1,500	Collision.
99	Chas. F. Lusk.........	101	Disability	Mar. 1, "	1,500	Bright's disease.
98	Joseph J. Seifert.....	291	Death	Jan. 30, "	1,500	Diabetes.
101	James L. Combs.....	304	"	" 24, "	1,500	Run over by engine.
109	Herman F. Rhoda....	29	"	Feb. 6, "	1,500	Falling from engine.
111	Walter F. Crawford..	223	"	" 10, "	1,500	Striking post.
86	William J. Remley...	202	"	Dec. 29, 1908	1,500	Collision.
92	Chas. Jenkins.........	90	"	Jan. 9, 1909	1,000	Apoplexy.

Death Claims Paid.

34—A	$51,000.00
3—B	3,000.00
6—C	3,000.00
1—D	2,000.00
2—E	6,000.00
46	$65,000.00

Disability Claims Paid.

6—A	$9,000
1—B	1,000
1—C	500
8	$10,500

54 death and disability claims paid, aggregating $75,500.00

Pending Claims March 31, 1909.

52 death claims aggregating	$74,500
39 disability claims aggregating	57,000
Total of 91 claims aggregating	**$131,500**

Statement of Death and Disability Claims

FILED WITH THE GENERAL SECRETARY AND TREASURER DURING THE MONTH ENDING APRIL 15, 1909.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
177	Chas. E. White	523	Mar. 16, 1909	Disability	Tubercular laryngitis	$1,500
178	Fred B. McKeeby	229	" 18, "	"	Paralysis	1,000
179	Wm. J. Watson	18	" 18, "	Death	Collision	1,500
180	James J. Culbertson	198	" 20, "	Disability	Amputation of foot	1,500
181	Ellis R. Kelly	94	" 20, "	"	Crippled foot and ankle	1,000
182	Wm. C. Pennock	18	" 22, "	Death	Crushed by falling rock	500
183	Theodore Fry	155	" 22, "	"	Tubercular peritonitis	1,500
184	Felix Smith	179	" 23, "	Disability	Bright's disease and heart trouble	1,500
185	John F. Bullock	546	" 13, "	"	Consumption of lungs	1,500
186	C. W. McDoniel	598	" 25, "	Death	Derailing of engine	1,500
187	Louis J. Petit	156	" 25, "	"	Deariling of engine	1,500
188	Lige Vann	304	" 27, "	Disability	Amputation of foot	1,500
189	John C. Gest	472	" 29, "	Death	Boiler explosion	1,500
190	Geo. W. Wood	149	" 29, "	Disability	Consumption of lungs	1,500
191	Dick Scholes	336	" 29, "	"	Paralysis	1,500
192	Warren Kritser, Jr	333	" 30, "	Death	Consumption of lungs	1,500
193	Chas. E. Larson	112	" 30, "	"	Consumption of lungs	1,000
194	Chas. Reese	490	" 30, "	Disability	Amputation of foot	1,500
195	Hunter F. Altare	236	" 30, "	"	Consumption of lungs	3,000
196	Archie Driesbach	436	" 31, "	Death	Struck by obstruction near track.	1,000
197	Chas. E. Jones	11	" 31, "	Disability	Bright's disease.	1,500
198	Marshall L. Thogmartin	153	" 31, "	"	Blind in one eye	500
199	Britton Huff	211	Apr. 2, "	Death	Struck by car	1,500
200	Samuel G. Lowham	88	" 2, "	"	Derailing of engine	1,500
201	Arthur Privitt	595	" 3, "	"	Measles	1,000
202	Edward Howard	304	" 6, "	"	Run over by cars	1,500
203	Harry Ferguson	99	" 6, "	"	Run over by train	1,000
204	James E. Adams, Jr.	275	" 6, "	"	Pott's disease	1,500
205	Wm. H. Gibbons	218	" 6, "	Disability	Deafness	500
206	Augustus C. Bering	74	" 6, "	"	Paralysis	1,500
207	S. C. Davis	618	" 6, "	Death	Gunshot wound	500
208	Merton H. Culver	141	" 7, "	Disability	Paralysis	1,500
209	Albert G. Klappstein	93	" 7, "	Death	Struck by mail crane	1,500
210	Wm. R. Wilson	502	" 7, "	Disability	Blind in one eye	1,500
211	Morris H. Tyler	379	" 7, "	Death	Typhoid fever	1,500
212	J. H. Zink	701	" 7, "	Disability	Locomotor ataxia	1,500
213	George Molby	150	" 7, "	"	Injury to knee cap	1,500
214	John E. Ellison	150	" 7, "	"	Deafness	1,500
215	John Bruno	141	" 8, "	Death	Consumption of lungs.	1,500
216	Chas. Coyne	508	" 8, "	"	Pneumonia	500
217	James Moran	68	" 8, "	"	Run over by cars	1,500
218	Jas. P. Flynn	291	" 8, "	"	Pneumonia	1,000
219	Logan Hooper	530	" 8, "	Disability	Heart disease	1,000
220	Wm. Perchley	464	" 9, "	Death	Collision	1,000
221	John. H. Eslick	658	" 9, "	"	Appendicitis	1,500
222	Boyd L. Walker	295	" 9, "	Disability	Amputation of foot	1,500
223	C. J. Cassell	9	" 10, "	Death	Bright's disease	1,500
224	Ezra R. Yeager	220	" 10, "	Disability	Ulcer of stomach	1,500
225	W. L. Mayfield	94	" 10, "	"	Sundry injuries	1,000
226	Don C. Buchanan	191	" 13, "	Death	Spinal meningitis	1,000
227	John C. Sandberg	679	" 13, "	"	Cancer	500
228	Nelson D. Henry	587	" 13, "	"	Collision	1,500
229	John W. Hamilton	37	" 13, "	"	Collision	500
230	F. M. Davenport	333	" 13, "	"	Consumption	1 500
231	Frank Woodward	525	" 15, "	"	Typhoid fever	500
232	Jake M. Gross	146	" 15, "	"	Pistol shot.	1,500
233	Frank E. Shanton	284	" 15, "	"	Run over by train	1,500

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Statement of Benevolent Claims.

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM FEBRUARY 28th, 1909, TO MARCH 31st, 1909.

Claim No.	NAMES.	Lodge No.	Amount Carried.	Amount Paid.
1215	William O. Pendery	677	$1,500	$ 500
1216	Willie E. Flint	163	1,500	500
1217	Samuel F. McCarty	319	1,000	500
1296	Charles W. Tice	463	1,100	600
1199	George A. Stirn	185	1,500	500
1298	John E. Jordan	592	750	750
1321	Edward B. Moon	431	750	250
1311	Cornelius H. Sherry	418	1,500	1,500
1333	Thomas A. Campbell	122	1,000	500
1346	Benjamin J. Hoffman	265	1,500	1,500
1421	Alvin Blett	240	....	1,500
470	Anderson Fraser	13	1,500	500
1379	Abram R. West	569	1,500	500
1254	Cyril Dumont	30	1,500	500
1393	Elijah B. Jones	372	750	750
1519	Louis M. Cramer	48	1,000	1,000
1084	John L. Madden	401	1,500	1,500
1126	B. L. Norman	602	1,000	500
1171	Edward J. Andrews	435	500	500
1220	John W. Carey	389	1,500	500
1349	Thomas L. Walton	146	1,000	500
1347	Alvin E. Montgomery	146	1,500	1,500
680	William Mullis	481	1,500	1,500
2181	Frederick L. DeLaria	82	1,500	500
905	Harry Hemphill	252	1,500	1,500
1183	Charles Portz	251	1,500	1,000
1327	Charles D. Moriarty	286	1,500	1,500
1463	B. F. Wagner	27	1,500	500
1489	James A. O'Connor	202	1,500	500
1508	Adolph Hanson	8	1,000	500
1536	James E. Eldridge	284	1,500	1,500
1540	Wm. F. Crittenden	59	1,500	500
958	Charles A. Souders	302	1,500	1,500
1012	David L. Price	634	1,500	1,500
1061	Emmett T. Worley	236	1,000	500
1506	J. H. Cunningham	83	1,500	500
1511	Henry C. West	409	1,500	500
2118	Wesley McCown	1	1,500	500
1125	Robert J. B. Bradley	602	1,500	500

39 claims paid aggregating $31,850.00.

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Beneficiary Assessment No. 4.

General Fund Assessment No. 6.

(SERIES I.)

OFFICE OF THE GRAND LODGE OF THE B. OF L. F. AND E.
PEORIA, ILL., May 1, 1909.

To all Members of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that Beneficiary Assessment No. 4 for the payment of death and disability claims, General Fund Assessment No. 6 and Local Assessments are now payable and must be paid to the Financial Secretary of your Lodge on or before June 1, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$3 30	$0 25	......
Class D Members	2 20	25	......
Class A Members	1 65	25	......
Class B Members	1 10	25	......
Class C Members	55	25	......

Local Lodge Assessment in such an amount as may be determined by your lodge, but in no case to be less than 25 cents.

Any member failing or declining to make payment, as above provided, will be subject to expulsion from the order, as per Section 170 of the Constitution, said expulsion taking effect June 2, 1909.

Yours fraternally,

W. S. CARTER,
President.

A. H. HAWLEY,
General Secretary and Treasurer.

Notice to Financial Secretaries.

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., May 1, 1909.

To Financial Secretaries of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified to collect Beneficiary Assessment No. 4, and General Fund Assessment No. 6 (now due and payable on or before June 1, 1909), from all beneficiary members on the rolls of your lodge May 31, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$3 30	$0 25	......
Class D Members	2 20	25	......
Class A Members	1 65	25	......
Class B Members	1 10	25	......
Class C Members	55	25	......

You will also collect from all honorary and non-beneficiary members General Fund Assessment No. 6, and from all members Local Lodge Assessment in such an amount as may be determined by your lodge (in no case to be less than 25 cents), and pay same to the Treasurer of your lodge on or before the fifth (5th) day of June, and forward a report to the General Secretary and Treasurer of all expulsions on account of non-payment of assessments, as per Section 170 of the Constitution. Every member admitted to the Beneficiary Department during the month of May will be liable for double the above amount for beneficiary assessment for the month of June, according to class of certificate.

Yours fraternally,

W. S. CARTER,
President,

A. H. HAWLEY,
General Secretary and Treasurer.

LOVE IS ABOVE EVERYTHING

BY ADELBERT CLARK.

Friends, Love is over everything!
Above the sun and flowers,
And above the gaiety of life
With all its pleasing hours.
Above the greatest tempting things
Of earth's vain pompous throng
That spreads its wings from sea to sea
And sings a careless song.

Its rays illume the darkest hours
And make the pathway clear,
And shut the Tempter's brawling mouth,
And whisper words of cheer.
It rules the world above the storm,
And links us man to man,
Until our whole great brotherhood
Is like a golden span.

O! could we each but understand
That Love's great strength is all,
We would not be discouraged when
O'er stumbling-blocks we fall;
But we would know that darkest hours
And heavy skies of rain
Are but to strengthen us each day,
And not to bring us pain.

Friends, Love is over everything!
Above the earth and sea,
Above the planets and the stars
That burn eternally;
Above the hearts of all mankind;
It keeps us sweet and strong
And opens up the path to God,
Through endless joy and song.

Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa.

Matters for the Grand President should be addressed to Mrs. Georgie M. Sargent, 2815 Fourteenth street, N. W., Washington, D. C., and that for the Grand Secretary and Treasurer to Mrs. Mary E. DuBois, 1603 First street, Boone, Iowa.

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The Quiet Way.

What's the use of worrying,
Of hurrying
And scurrying,
Everybody flurrying
And breaking up their rest,
When everything is teaching us,
Preaching and beseeching us
To settle down and end the fuss,
For quiet ways are best?

The rain that trickles down in showers
A blessing brings to thirsty flowers,
And gentle zephyrs gather up
Sweet fragrance from each brimming cup,
There's ruin in the tempest's path,
There's ruin in the voice of wrath,
And they alone are blest
Who early learn to dominate
Themselves, their violence abate,
And prove by their serene estate
That quiet ways are best.

—Josephine Pollard.

The Battle for Bread.

The older I grow, and the more I come in contact with humanity, its struggles, conflicts, and ups and downs, the more am I in sympathy with the principles of life insurance. In my earlier years when my premiums became due, I thought them a nuisance and condemned the company that was protecting me and mine. But as the years roll by, I am more and more convinced that no sane man who loves his family and his God, will harbor the least ill-will toward an institution that really protects the home. What I see from day to day, enough to chill the blood of an athlete, has led up to this conviction. In my daily rounds among the people outside my church, in pastoral touch with my flock, hundreds of times have I discovered the improvidence of husbands and fathers. It is enough to make an angel weep to see the poverty, the suffering, and the wretchedness of scores of families.

Once Well-to-Do.

Widows, with little children hanging to their skirts, with hunger on their faces, and despair in their eyes, alone are an eloquent protest against the carelessness of men in making no provision whatever for their loved ones after death. Whom do we find at the head of boarding houses, rooming houses, in our great cities? Widows! Wan and pale-faced, the very picture of distress! Working on, night and day, to care for and educate their children; deprived of church privileges, home comforts, and social cheer, they are compelled to drudge on, year in and year out, scarcely able to make both ends meet. White slaves indeed are these tens of thousands of widows, struggling to keep together their darlings! Look, too, at these brave women in stores, behind counters, selling goods at starvation wages. When night comes on, behold them trudging home with their pittances, scarcely able to drag their feet. Gaunt and haggard, they throw themselves down on their couches to toss and weep. And the seamstresses, too—working in damp rooms, toiling from early morn till late at night, bringing an income of only four or five dollars a week for food, rent and clothing to keep their children at school and from want.

"Work, work, work!
  From weary chime to chime;
Work, work, work!
  As prisoners work for crime.
Band and gusset and seam,
  Seam and gusset and band,
Till the heart is sick, and the brain benumbed,
  As well as the weary hand."

But Who Is at Fault

for this awful social condition? Is it because of the hard times? Never were they better. Is it because America does not afford work for its toiling millions of men? Our cattle are on a thousand hills! Our land flows with milk and wild honey! Goodness and mercy from a provident Creater is manifest in our material productions and our commercial progress! The only answer is: Man's improvidence, sure not God's providence!

If a husband loves his wife, if the marriage altar means anything, if the sacred plight and the wedding ring were sermons in themselves, there would be far different conditions among widows and orphans in our God-favored country. Self-protection is the first law of nature. If a man really husbands and cares for his wife and children he will see well to it that they are well housed for the rainy day, the dark day, and the Black Friday. They would never come if life insurance had been properly understood.

I believe our public schools should have a chair, or at least a lecture once a year, on life insurance. Children would thus be trained along the line of self-preservation and home protection.—The Loyal Workman.

• • •

If we read the Bible aright, we read a book which teaches us to go forth and do the work of the Lord; to do the work of the Lord in the world as we find it; to try to make things better in this world, even if only a little better, because we have lived in it. . . . . We plead for a closer and wider and deeper study of the Bible, so that our people may be in fact as well as in theory "doers of the word and not hearers only."—Theodore Roosevelt.

• • •

Character-Building Through Reading Books.

The habit of holding the mind steadily and persistently to the thought of a good book not only increases the power of concentration, but also improves the quality of the mind.

Inspiring reading is that in which life-building words abound—for words are things which unconsciously enrich character. The image of each helpful word held in the mind leaves its impress, its autograph, so to speak, there, and continually reproduces itself in uplifting thoughts.

The boy or girl so nurtured will have been given the best means of acquiring a mentality of the very highest order.—March Success.

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Women and Money-Spending.

If women are more economical than men, as is sometimes stated, it is to be wondered at. Why should they be? The woman shopper is led in various ways to feel that she is a most important person. Obsequious clerks under penalty of dismissal wait upon her patiently, or call attention to their choicest wares. The merchants spare no opportunity to part her from the contents of her purse, the while they flatter her vanity. The whole vast store, with all its wonders and all its trash, exists for her. Seemingly innocent temptations pull at her purse strings, and pleasant trifles wheedle her with their cheapness. The modern store is a veritable palace of temptation. The weak are allured with promises of credit, the strong are often beguiled before they are aware, while thoughtless women are likely to gather the impression that the adornment of their persons and the beautification of the home are the chief ends of money-spending.

In no other place can the truth be brought home so forcibly that women are the real spenders of the civilized world, than in a busy store thronged with women gayly dressed as for a social gathering, and women plainly dressed, and some in shabby clothes. The stores are filled with women, not men, shoppers. It is the women who do the marketing, who buy the groceries, the milk, the ice, the family stores, the children's clothes and their own. As society is at present constituted the spending of money, in the majority of cases, falls to the women. Then since women are mainlv the spenders of the world, they should bestow as much thought on that work as the men bestow on earning.—Harper's Bazar.

* * *

Contentment comes neither by culture nor by wishing; it is reconciliation with our lot, growing out of an inward superiority to our surroundings.—Rev. J. K. McLean.

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A Sign of Health.

An original letter from Benjamin Franklin to a personal friend is to be found among other relics in Independence Hall, Philadelphia. This highly suggestive sentence occurs therein: "I am pleased with your punning, not only because I like puns, but because this shows that you are in good health."

The genial philosopher did not need to explain why this was a sign of health. It is true that many a heroic spirit has concealed the sharpest pain under cover of cheerful manner and merry talk, but it is no less true that the spontaneous overflow of genuine fun usually means a comparatively vigorous condition of body, or at least of the mind. Hypochondriacs, pessimistic and generally grumpy people do not make merry usually.

There is something amiss either with the character or with the condition when a man fails utterly, under ordinary circumstances, to appreciate a bit of innocent and genuine mirth and a hearty laugh. Living is indeed serious business. Franklin himself found it anything but a joke, yet "Poor Richard's Sayings" and many others from his pen and lips proved the wholesomeness of his nature and the healthful state of his mind. A perpetual joker is an abomination hard to tolerate amid the real solemnities, but one who never had any fun and never makes fun at all lacks one very important element of physical and mental health and one sign thereof.—Selected.

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Ten Largest Lodges in Ladies Society of B. of L. F. and E.

Below is given the ten largest lodges of the Ladies Society of the B. of L. F. and E., as reported April 1, 1909:

1.	No. 3, Hazel, Peoria, Ill.	122
2.	No. 142, Empire, Buffalo, N. Y.	112
3.	No. 60, Pride, Harrisburg, Pa.	100
4.	No. 70, Holly, Buffalo, N. Y.	88
5.	No. 151, Missouri, St. Louis, Mo.	87
6.	No. 113, Ft. Orange, Albany, N.Y.	82
7.	No. 125, Charity, Jackson, Mich.	81
8.	No. 51, Grayson, Denison, Tex.	77
9.	No. 15, Forest Flower, Cleveland, Ohio	73
10.	No. 91, Mountain City, Altoona, Pa.	69

* * *

Charter Applications.

Charter applications have been received from the following places:

Kankakee, Illinois.
Orville, Ohio.
Dallas, Texas.
Houghton, Mich.
Centralia, Illinois.
West Roxbury, Massachusetts.
Proctor, Minnesota.

* * *

Notice from Grand Secretary.

Lodges wanting a copy of the Official Drill Manual should send to me. The cost is twenty-five cents to defray the cost of printing.

MRS. MARY E. DUBOIS,
1603 First st., Boone, Iowa.

* * *

New Brooms and Old.

For ten years Mrs. Fendall had been secretary of the Granby Home Missionary Society. During that time the society had accomplished much valuable work and become a powerful influence in the community, but now many of the original members were growing old, and in order to maintain efficiency in the work some young women were brought in.

It was not easy for some of the older workers, for the new members had their own ideas, many of which were strange and disquieting. It was evident that their day—the day of the older ones—was over. When elections came, although the former president was re-elected, the younger women elected a secretary from their own number.

If Mrs. Fendall felt hurt she did not show it. After the meeting she went up to the new secretary with frank and generous friendliness.

"I will give you the books tomorrow, my dear," she said, "and if there is ever any way in which I can help you, it will be a great pleasure to me."

The new secretary thanked her, but did not accept the offered help. To herself she smiled at the idea of this old-fashioned secretary helping *her* with her up-to-date ideas!

But somehow there were all sorts of unexpected complications. Finally one day she swallowed her pride and went to Mrs. Fendall's.

"I can't understand it at all," she said. "Here's such an aggrieved letter from a Mrs. Blanding, and another from a missionary's wife in Dakota, and three or four others have written that they can not do anything this year, yet I can't get hold of the reason. *Can* you help me?"

"Why, of course," Mrs. Fendall replied. "Don't be discouraged. You can't be expected to know everybody at once. Mrs. Blanding is an invalid back in the hills. She has very little in her life, so I fell into the habit of mailing her a leaflet every week or so. It took only a minute, and meant a great deal to her.

"Mrs. Parsons in Dakota used to live here as a girl, and likes a bit of village news tucked in with business, and old Mrs. Morton—did you call upon her in the morning? I thought so. She is mortified because you caught her in her working dress. Drop in some afternoon, and you can make it all right. Miss Mullin is probably hurt because you didn't ask about her spine. I found that the way to her heart is through her spine."

The new secretary drew a long breath. "The other day," she said, "I heard my cook grumbling over the new waitress. 'Talk about new brooms sweeping clane! Mebbe they do, but it takes old brooms to find the corners!' Dear Mrs. Fendall, will you help a very ignorant 'new broom' to find her 'corners'?"—Youth's Companion.

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Hints to Nervous Women.

There are many things a neurasthenic woman can do which will mitigate the severity of her symptoms, and perhaps, if the disease is slight, she may recover without the intervention of her physician. In the first place, the original trouble, worry, or anxiety which was responsible for her nervous breakdown must be done away with, or, if this is impossible, she must school herself not to care, or else remove herself to new scenes and surroundings where her mind will not be harrassed. Peace of mind will do more to restore shattered nerves than almost anything else. The next thing is to make the bodily health as good as it can be made under the existing circumstances and surroundings. Sleep and rest are absolutely essential to recovery, and the sufferer should do all she can to secure both. Narcotics to produce sleep, are not to be thought of. They do not cure anything, and their continual use can only be productive of harm. Tranquilize the mind, banish by force of will unpleasant thoughts, and sleep alone rather than with some one else whose restlessness or deep breathing, to say nothing of snoring, might well banish sleep from the eyes of even Morpheus himself. Sometimes a warm foot-bath before bed, or eating a slice of bread and butter, or drinking a glass of milk will bring sleep to the tired eyes. If, however, these means are inadequate it is better to consult a physician. Normal sleep, and plenty of it, must be secured before recovery becomes possible.—Dr. Graeme Hammond.

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The Dance a Success.

Black Hills Lodge 86, Brotherhood of Locomotive Firemen and Enginemen, gave its thirty-first annual ball last night at Maennerchor hall, and as on former occasions, it was a pronounced social and financial success. The hall was filled with members of the lodge and their lady and gentlemen friends to the number of more than two hundred. The decorating committee had done excellent work in decorating the hall, the whole interior of the auditorium being lined with red, white and green cloth, the colors of the signal flags and lanterns of the Union Pacific railroad, and more than three hundred colored electric, signal and hand lamps being used to light the room. The initials of the other railroad organizations of the division were displayed in evergreen against the walls and signal flags draped the front of the stage, the full Niethe orchestra having seats behind curtains of the colored bunting. Banners bearing the shield of the road and the name and number of the lodge were displayed at intervals.

One noticeable feature of the gathering was the presence of a large number of the officers of the lodge in the regalia of their rank, visitors from Cheyenne, Rawlins and Hanna and some of the officials of the Wyoming division, including District Foreman Highleyman, General Foreman Frank Davidson, and Chairman J. Q. Matthews of the board of examiners. Mr. and Mrs. Davidson led the grand march, District Foreman Highleyman coming next with Mrs. Frank Coolican on his arm. There were nearly a hundred couples in the grand march, which started at 9:30, and half as many couples who did not attempt to take part in that feature of the excellent program.

The order of dances consisted of twelve numbers in each half, with room for a number of extras, and included waltzes, two-steps, five-steps, the circle waltz, three-steps, Lanciers, robbers, two-step, a schottische and quadrille. Supper was served on the stage by the ladies' auxiliary from 11 to 1 and was quite well patronized by the dancers. The whole affair was managed with consummate skill and tact, none but having a feeling of elation and satisfaction at the evident success of the whole undertaking. The firemen, as always heretofore, made good in their annual ball, and not one but felt the present was as pleasant as any heretofore.—Laramie Republican.

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Missouri State Meeting.

The time is fast approaching for the packing of our grips and be off for the Missouri State Meeting to be held May 17, 18 and 19 with White Carnation Lodge 65, in Nevada, Missouri.

Wonder how many of the Missouri sisters are thinking about it, and are you rushing the spring work, so as to meet with us there?

Carnation Lodge has promised us a pleasant time, and we want to make a good showing, and get much good out of this meeting, for there is good in them. Last year the State Meeting was held in Sedalia with Pride of 78, No. 225, and a wonderful interest was shown by all present, No. 225 being especially benefited by it.

It is to be hoped that every lodge in the State will be represented in this meeting, and we are also anxious to have visitors from the neighboring States to encourage us with their presence.

Last year we had a representative from the Grand Lodge with us, Sister Agnes G. Strong, and I don't know what we would have done without her, as we were so new in the work and we would be so glad to have her with us again this year and as many of the other Grand Lodge officers as can possibly attend.

But I know of one sister who will be there, Sister Mollie Sparkman, of Moberly, Mo., the newly appointed instructor for this State, and vice-president of the Missouri State Meeting, and I know that she will be prepared to teach us many things. These meetings are to be schools of instruction and to promote interest as well as sociability among the sister lodges.

Now, sisters, exert yourselves a little if you have to and attend this meeting. The good derived from it will more than repay you for all the trouble you are put to.

Fraternally,
JENNIE LEWIS, State Secretary.
Sedalia, Mo.

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A Delightful Party.

We of No. 128 are usually very quiet. But Wednesday evening, March 31, we had a rousing jollification, and I fear if anyone had cared to listen they might have thought we were out for a time, and all of the brothers and sisters present surely had it. We spent the evening with Brother and Sister Lawhead. We played games and had delightful music, and, last but not least, we had a ten-cent lunch served, and methinks I heard some of the brothers remark that they wished they could strike a lunch like it for ten cents on the road.

Midnight, April 1, found us just starting home, and all felt well repaid for the effort put forth and all were agreed that the party was a decided success.

ONE WHO WAS THERE,
North Platte, Neb.

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While the Days Are Going By.

So many instances could be cited of the good that lodges are doing while the days are going by, that from the many this article has been taken.

A woman was very ill, suffering from cancer. Her husband, becoming a common drunkard, deserted her, leaving her with the care of two children, to get along as well as she could.

She was a proud woman and never told the members of her lodge just how destitute she was, and not until they visited her in the dead of winter and found her in bed with her smallest boy beside her trying to keep warm from the heat of a single-burner oil stove were they aware of her condition. The good sisters were shocked at the state of affairs and at once had her placed in a hospital for treatment. She was there but a little while when the struggle became too great and gladly she turned her eyes toward another land that held out all that had been denied her here. Her lodge furnished the entire burial, from the simple casket to the soft, white robe they wrapped her in, and as she was not an insured member not one penny was received for recompense. It was done in the sweet spirit of charity and sisterly love.

Surely this deed found favor in the high heavens, and, as at another time, when a woman ministered unto our blessed Savior, and wherever Christianity has been taught it has been handed down as a lasting monument throughout all time to her, so shall deeds like this be recorded in the book with seals to be broken only at the judgment day; where all the sweet things in this life and the bitter ones, too, shall be laid away, and united we shall see our Savior's face; where we shall—

"Tell Him about the heartache,
And tell Him the longing, too;
Tell Him the baffled purpose,
When we scarce knew what to do.
Then, leaving all our weakness
With the One divinely strong,
Forget that we bore the burden
And carry away the song."

BY IMOGENE BATES.

Charity Lodge No. 125.

Charity Lodge No. 125 is on the gain. We have initiated several candidates during the past three months, and applications are being presented at every meeting.

The winter has passed very pleasantly in a social way. The "boys" of No. 240 have put forth every effort to make the alternate joint meetings a success in every way; the result is we have been right royally entertained.

At these evening social sessions a number of interesting papers have been read by members of both orders and were much enjoyed.

On the evening of February 23d a dance and card party was given at White Block hall, by a very capable committee from the Ladies Society. To speak emphatically it was a "howling" success and was the means of swelling our treasury fund by a very neat sum.

On Saturday evening, April 10th, we will serve an Easter supper and also hold an apron sale at Webb Block hall. In anticipation of this apron sale we have held many pleasant sewing bees at the homes of several members, not the least pleasing feature of which has been our "pot luck dinners." We hope to realize a neat sum from both supper and sale.

On Easter Monday the brothers of No. 240 will give their annual ball at the new Masonic Hall Temple. A joyous time is anticipated, as every effort is being put forth by the committee to make the ball even better than what has seemed in years gone by, the best.

Long before my letter goes to press no doubt all sisters will be very busy at the annual spring house-cleaning. I sincerely hope our correspondents will not neglect the Magazine columns at that time. Try to find a few moments time in which to let us know what you are doing. And try, also, to regulate house cleaning so that you may not be obliged to miss the regular lodge meeting.

In the meantime kind greetings to all and may the gladsome springtime bring joy to you all.

MRS. LOUIE STODDARD,
Jackson, Mich.

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A small drop of ink
Falling like dew upon a thought, produces
That which makes thousands, perhaps
millions, think.
—Byron.

Letters from Friends.

FROM L. S. 201—(*Mrs. Ida Roderick, Chicago, Ill.*) As I have been elected correspondent, will let the sisters know what good work our lodge is doing.

November 28, 1908, we held our fifth grand reception and ball, which was a grand success, clearing forty-two dollars and a half. Sister Mae Metzinger, our worthy past president, was appointed chairman and all members worked very hard. The sisters wish to thank the brothers of Lodge 188 for attending the supper, which the sisters served at their 23d annual ball held December 16, 1908. We cleared the sum of $16.45.

We gave a farewell party for Sister Spelton, who is moving from Chicago to make her home in Savannah, Ill.

To keep up the good work and make things prosperous we are keeping our "goat" well fed, as we have three candidates for our next meeting. We extend a cordial invitation to the sister lodges in Chicago to visit us. We hold our meetings the second Thursday afternoon and fourth Friday evening. We will hold our next joint meeting with the brothers of No. 188 April 20th. A cordial invitation is extended to the sisters and brothers of this city to attend.

Sister Maher will entertain the sisters at her home March 17th.

We are looking forward to many social events and will be heard from again.

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FROM L. S. 241—(*Mrs. Maggie Roberts, Lima, Ohio.*) We are still actively engaged in the work of the Ladies Society, and although a little slow in securing new members yet we have broken the spell and have two candidates for our next meeting. Sister Alspach of Lodge 41 of South Cumberland, Md., was a visitor at our last meeting, but now resides west of Delphos, Ohio, and is thinking of transferring to No. 241, and we truly hope she will, for she is a great lodge worker and loves to attend every meeting possible.

Lodge 241 held its first joint meeting with the "boys" of No. 184, and we all enjoyed it so much. Refreshments consisting of ice cream and cake was served by the sisters and cards and dancing made the evening merry. We are to have joint meetings once a month. Best wishes for our Editress and all sister lodges.

FROM L. S. 244—(*Grace Posey, Teague, Texas.*) As I think the Ladies Department has had only one letter from our lodge since we were organized, I will write and let you know what we are doing. We are just eight months old and have a fairly good attendance at all meetings, and all members take an active interest in all that pertains to the order.

On Thanksgiving we assisted the brothers of Valley Route Lodge 702 in giving our first annual ball, which proved to be a splendid success.

December 19, 1908, we gave a linen shower for one of our brides, she having been married January 3, 1909.

We have had several joint meetings, which are always well attended. With best wishes to our Editress and all sister lodges.

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FROM L. S. 144—(*Maggie Hood, Yoakum, Texas.*) As correspondent I want to tell you of some of our goings-on to keep in line and touch with our sister lodges. No. 144 is wide awake, and holding its two regular meetings a month, every second and fourth Tuesday afternoons, and one joint meeting a month. Our joint meetings are very enjoyable affairs. We try to have at each meeting an interesting program and always serve refreshments afterwards. Our membership is now twenty-four. Last year we took in four new members and we now have on file waiting four applications. We were very much pleased that the age of children that could be admitted to the lodge room was changed, for it affected us materially, for most of our members are mothers and housewives, and could not leave their little ones at home alone, and according to the child age heretofore could not take them with them to lodge, so we have a much better attendance since the new ruling.

We have an afternoon club known as "Friendship." We meet at the different sisters' homes, taking the names alphabetically. These meetings are always very enjoyable.

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FROM L. S. 240—(*Laura Kathleen Davies, Gainesville, Texas.*) We are glad to greet you sisters in the year 1909, and to wish each lodge a prosperous year's work.

We are very proud to say we have

prospered in just the thirteen months of our existence. Our membership grows rapidly; almost at every meeting we receive applications. At our next meeting we have three candidates to take through the ceremonies of initiation. We now have a membership of thirty, so you see we have not been idle and our work together has been most pleasant and profitable.

I will tell you of our first entertainment, held February 23, 1909, the occasion being our first anniversary. A very interesting program was rendered, consisting of vocal and instrumental music recitations and a very appropriate reading by Sisters Rison and Grover. An elegant luncheon was served and the tables presented a fine appearance, with their beautiful bouquets of carnations. About one hundred partook of the feast of good things. The remainder of the evening was spent in dancing the "light fantastic," and all enjoyed themselves hugely.

During the last six months we have lost two of our sisters by removal, Sisters Seawell and Townsend, and to each we gave a surprise in the nature of a farewell reception and left each a token of our love and esteem for them. We are sorry to lose these sisters, but we know that our loss will be some one else's gain.

It is our wish that all sisters will work even harder this year for the Society and try and make each meeting better by good attendance.

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FROM L. S. 158—(*Mrs. Calla Gowdy, Clinton, Ill.*) Having enjoyed reading the letters from other sister lodges gives me an inspiration to tell you about No. 158. We have 28 members—so many have moved away and taken withdrawal cards that it has cut down our membership. But the few that are left are doing nicely. Our attendance at meetings during the past year has not been as great as we should like to see, but many have had sickness and many have small children at home and cannot leave them. We hope to do better in the future. We find serving light refreshments after the regular meetings has a tendency to better attendance. Each takes her turn at serving, taking the membership alphabetically.

The brothers of No. 176 gave an oyster supper in their hall for all members and their families and the unmarried brothers and their sweethearts. The hall was gaily decorated for the occasion with flags and bunting and each guest received a carnation at the door for a souvenir. There were fifty couple who were invited into a large spider web, which was made in one corner of the hall, with twine running to various objects, and when unwound we each found a prize, and the gentlemen having a duplicate prize took that lady to supper. This caused much merriment, and all became so quickly acquainted. We sisters were to furnish the entertainment and the brothers the supper. Before supper a musical program was greatly enjoyed and among those taking part on the program was the Clinton High School Orchestra, and some of Clinton's most talented people gave vocal and piano solos.

We gave a card party December 17, 1908, and part of the proceeds were for the Highland Park Home. We have our piano most paid for and we feel quite proud of it.

We have two real candidates for our next meeting and are getting the "goat" in trim for them; also have an applicant to ballot on.

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FROM L. S. 121—(*Mrs. Ida Pfenning, Indianapolis, Ind.*) As I have been approached on this subject quite a number of times I would like to say a word to the wives, mothers, sisters, and daughters of members of the Brotherhood of Locomotive Firemen and Enginemen and who are not members of the Ladies Society. The Ladies Society was organized for the purpose of rendering assistance, encouraging the Brotherhood of Locomotive Firemen and Enginemen in their good work, extending the hand of charity, helping each other in time of need and elevating our social and intellectual standing. It is the aim of our Society to cultivate a spirit of harmony, to promote sociability and draw into friendly and affectionate relationship the lady members of the families of the Brotherhood. Hence we have adopted for our motto "Friendship and Charity." Camillia Lodge 121 has entered the new year with four applications and several more to follow. We have not made the progress we might have made, but we have worked faithfully to increase our number and to get the wives, mothers, sisters, and daughters of the brothers interested in this good work, and we hope that the day is not far distant when we may reap the fruit of our labors with the assistance of the brothers. Our one hope is that we can double our number this year.

On the evening of February 18th, Camillia Lodge 121 and Eureka Lodge 14 held a joint social at their hall. All members and their families and prospective members were invited. Everything was free. We played cards and served lunch in our banquet hall, consisting of sandwiches, coffee, pickles, ice cream and cake, and everybody went home wishing that we would have another one soon. On the evening of February 22d Sister Fisher gave a card party at her home for the lodge members and their friends. She had a large attendance and everybody had a jolly good time. On the evening of March 6 Sister Waugh gave a card party for the members and their friends. I think that Sister Waugh appreciates our company, for that was the second time that she has donated her home for us to have a good time in. The ladies gave a dinner at the hall on March 11th, and every member did their part to make the dinner a success. All of the brothers were invited and quite a number responded to our invitation; among the brothers that attended was Brother McNamee. The dinner was a success and everyone enjoyed it, so we will try and give another one soon. After the dinner we had our meeting. Camillia Lodge 121 meets every second and fourth Thursday afternoon at Pearson's hall, 135 North Delaware street.

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FROM L. S. 8—(*Grace Iler, Garrett, Indiana.*) As it has been such a long while since you heard from No. 8 I will endeavor to let you know that we are neither dead nor sleeping. I am sure you would not think so if you could attend some of our meetings. We are getting along nicely, although at times we have had meetings with small attendance and it is discouraging for the officers when they enter the lodge rooms and see just enough present to fill the officers' chairs. Some of the sisters do seem indifferent. We should all work together and not leave it for a few to do the work. Some seem to think when they pay their dues that they have done quite enough, but how long would there be a lodge of the L. S. if all felt that way? Officers can not do things without assistance. If you have a grievance against a sister do not let that keep you away from meeting and let the whole lodge suffer for a little personal affair. We should strive to understand more fully the meaning of our beautiful motto "Friendship and Charity" and to inculcate it in our lives.

We are giving social afternoons once a month at the different members' homes and charge a nickel for the refreshments. In January we held it in the lodge rooms and the brothers turned out and helped to swell our funds materially. We think we have the finest lot of brothers in the country, and we are in receipt of an invitation from them (boys of No. 203) to help them celebrate their twenty-fifth anniversary March 8th, and we are looking forward to a jolly good time.

I am sorry to report one of our sisters very ill at this time—Sister Putt—but hope I can report her entirely recovered when I write again. In the midst of life we are in death, and it makes me sad to tell you of the death of Sister Mary Schudel, a true and trusted sister. In the death of Sister Schudel our lodge loses one of her best members, for she had a kind word for everybody and was always ready to help in time of need, and we could always depend upon her for counsel. To the bereaved we extend our deepest sympathy, and commend them to the Great Comforter, who can heal the broken hearts.

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FROM L. S. 134—(*Mrs. Winifred Vanskike, Moberly, Mo.*) Yes, we are alive and thriving and our "goat" has been so busy the past few months that we have gotten him rather tame.

The interest in seeking new members the last few months has been increased by a contest in this wise: Two leaders were chosen from the membership and sides were chosen until all members were on one side or the other. The side securing the greatest number of new members will be banqueted by the losing side. Needless to say every one is working with a will and our membership is rapidly increasing. Our next regular meeting closes the contest, which has extended through two quarters.

Socially we have been quite successful the past year. We have had a Japanese social, peanut party, ice cream socials and a mask and exchange social. The latter was given February 15, 1909, and although a snow-storm was raging, there was a good attendance and a neat sum cleared for our treasury.

Once each month the L. S. and lady friends are entertained at the home of one of the members. These afternoons are looked forward to with much pleasure. Such social afternoons bring the sisters in closer touch with each other and make them feel a more personal interest in each other.

At last we have accomplished what we have long strived for—a permanent date for joint meetings with the brothers of Anchor Lodge 54. These meetings are held the last Thursday of each month. After the secret meeting is adjourned—a social hour is enjoyed and refreshments always served. Every other meeting the boys prepare and serve the lunch. How important they are while waiting upon the ladies. And how the ladies do enjoy it.

Several meetings ago the brothers of No. 54 presented the L. S. with some dishes. They were greatly appreciated, not only for their intrinsic value, but for the kind spirit that prompted the gift.

Our worthy president, Mrs. Mollie Sparkman, has been appointed instructor for the State of Missouri. How well we know she was rightly chosen, for she is perfectly capable of filling with credit this responsible position. If we all had the good of the order at heart as much as Sister Sparkman we would indeed be a greater, better and more prosperous order today.

Sister lodges, remember our "latch-string" is always on the outside for visiting sisters.

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FROM L. S. 154—(*Edith Magoon, Newport, Vermont.*) In looking over the Magazine for this month I noticed that all the letters of greeting and cheer came from the Western States. How about old New England? Perhaps the Magazine correspondents were frozen up with the winter. Anyway it is coming spring now. Our Southern sisters have sent us back the robins and in return we are going to send them a letter.

We are still holding one meeting a month and for the number that attend meeting are doing well. We hope that during the summer months more can attend.

I am sure, sisters, if you would only begin to come you would not want to be absent from a single meeting. Perhaps the first meeting is interesting, but the more one attends the more one wants to, and the more interesting it becomes and finally you find yourself and the lodge one. How can we expect our President to keep up courage unless we are there to help her? How many of the sisters have taught school? How did you feel when you went into your schoolroom enthused for the day's work and found two-thirds of the little faces missing. Could you give the satisfaction that was expected of you? No. If we want our lodge to prosper—if we want our President to do good work, we must attend meetings regularly and give our whole heart for the good of the order.

We have been having a joint meeting and social every two months. The last was a poverty party and a merry time was enjoyed.

What meaneth the happy smile on Brother Ayer's face? A baby girl, of course. Congratulations, Sister Ayers?

With good wishes for all sister lodges and with a hope to see you and our dear Editress, Agnes Strong, at the Union Meeting in Albany, N. Y.

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FROM L. S. 19—(*Mary Tilley, Knoxville, Tennessee.*) Having seen nothing in the Magazine from Tennessee we feel it incumbent upon No. 19 to make a start, and now more especially, as we have something important to write about.

During the last year we have doubled our membership roll and we hope to more than double it the coming year. I am also happy to state that we have never lost a member, although our Magazine correspondent has moved to another place and cannot meet with us often.

We have one member on the sick list, but trust she will be entirely well soon.

We have good attendance at meetings and our prospects are brighter than ever before.

I must tell you of our first anniversary celebration. We had it on a meeting day and had a real candidate to ride our one-year-old "goat." After the "goat" was led away the doors were thrown open and the brothers came in and helped us hang sheets for moving pictures, getting chairs in readiness and made themselves generally useful. Tickets had been sold and a goodly number responded. A fine program had been prepared consisting of illustrated songs, recitations, dialogues, good music by a good orchestra, after which refreshments and home-made cakes were served. Every one seemed satisfied and we cleared twelve dollars, besides the promise of several applications which we hope to have soon.

The boys of 444 did their part nobly, and to show our appreciation for their kindness we are going to surprise them with refreshments after their next regular meeting. For fear of wearing out my welcome I will close with best wishes for a prosperous year to all brother and sister lodges.

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FROM L. S. 242—(*Mrs. Emma Crawford, Alliance, Ohio.*) Acme Lodge was organized June 12, 1908, at Modern Woodmen Hall, with Sister Jennie Creah, of Forest Flower Lodge 15, as organizer. Eight charter members opened the first meeting. Seven new members have since been added and we have several applications on file awaiting admission.

The brothers of Stake Lodge No. 630 have been very generous to us, paying our hall rent and giving us an elegant banquet the evening we were organized, which was greatly appreciated.

We meet the first and third Wednesday afternoons of each month at 1:30 o'clock.

Our meetings thus far have been well attended and we trust the members will remain interested in the good work.

At our last meeting we organized a sewing club to meet at the homes of the sisters every two weeks. A luncheon is served by the hostess, for which the sum of ten cents is collected. We are limited to three articles to eat and one to drink, and fined if more is served.

At each meeting our President appoints a committee of two for "the good of the order"; this creates an interest and plenty of amusement. We also have a social time whenever we have initiation, so that all may become well acquainted with the new member.

We are getting along fine, and with such splendid workers we expect to be among the largest lodges soon.

We extend a cordial invitation to all visiting sisters to meet with us.

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FROM L. S. 247—(*Mrs. Mary Dukeshier, Sheridan, Wyoming.*) After reading the letters in the Ladies Department from the sister lodges it gives me an inspiration to do likewise. Pride of Big Horn Lodge 247 was organized on the 15th of October, 1908, with nine charter members.

We have been rather slow in getting our letter to the Magazine. We have had several box socials, and on February 22d, we gave our first annual ball, which proved to be a decided success. The hall was gaily decorated in honor of the day in red, white and blue. All went merry, and our treasury was enriched seventy-five dollars.

We have appointed a committee to confer with the brothers to arrange for a joint meeting. We are but few in numbers, but have jolly times.

◆ ◆ ◆

FROM L. S. 174—(*Mrs. Mabel Porter, Chickasha, Oklahoma.*) I will now make my first attempt at letter writing for the Ladies Department. Washita Queen 174 was organized June 17, 1908, by Sister Allbaugh, of Shawnee, Oklahoma, with sixteen charter members. The brothers of Washita Lodge 515 were very generous to us, paying all of the expenses of organizing. We are steadily growing in interest and in numbers.

On February 22d we gave a ball, which was very successful, clearing about forty dollars.

Best wishes for all sister lodges.

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FROM L. S. 171—(*Hannah Gibson, Austin, Minnesota.*) Golden Jubilee 171 is still prospering. We have twenty-six members, but it is not possible for all to attend every meeting, for some of our members live out of the city. They were obliged to move on account of the brothers going out on the new extension work, but we hope they will all come back soon again.

We have organized a sewing circle; we meet in the afternoons and do all kinds of sewing, which we expect to sell later at a sale.

* * *

FROM L. S. 51—(*Mary Platt, Denison, Texas.*) No. 51 is getting along nicely. We have a very good attendance at every meeting. We meet the first and third Wednesday of each month. On the second of February we celebrated our tenth anniversary. There are only two charter members left, Sisters Smith and Fairly. After meeting adjourned a social time was indulged in. Sister Smith gave a very interesting sketch of the work done by our lodge since its organization up to the present time. Music and conversation, after which dainty refreshments of candy and fruit was served.

There is quite a little sickness now among the sisters and we try to cheer them by calling upon them and always ready to assist in time of need.

We are slowly but steadily increasing in membership. With greetings to all sister lodges.

* * *

FROM L. S. 113.—(*Myrtle Shaul, Albany, N. Y.*) On the evening of February 10th we gave in McEleveny's Academy an old-fashioned country barn dance. The ladies in attendance were attired in calico gowns and sunbonnets, while the men wore overalls and jumpers. Refreshments were served, consisting of doughnuts, ginger-bread and sweet cider, and, well you know that railroad people can do full justice when it comes to this part of the program.

At our last meeting we initiated two new sisters into our lodge, making our membership now eighty-three.

At our next meeting we gave a euchre party in our lodge rooms.

Fraternal greetings to all sister lodges.

* * *

Death Report.

Goldie M. Hosier, Lodge 123, died January 29, 1909; cause, abscessed appendicitis. Insurance, $200.

Rena Crist, Lodge 3, died February 6, 1909; ause, septicemia. Insurance, $200.

Quarterly Insurance Assessment.

Second Series Numbers.

Notice No. 26, for the Quarter ending June 30, 1909.

GRAND LODGE
LADIES SOCIETY OF THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

Office of
GRAND SECRETARY AND TREASURER.

BOONE, IOWA, June 1, 1909.

To all Treasurers of Subordinate Lodges:

SISTERS—Assessment No. 26, for the quarter ending June 30, 1909, is hereby levied upon all members holding membership in the Insurance Department of the Society on or before May 1st, 1909. You will forward to this office so as to reach here on or before the tenth day of June, 1909, the sum of sixty (60) cents from each member carrying a $200 policy, one dollar and twenty ($1.20) cents from each member carrying a $400 policy and one dollar and fifty ($1.50) cents from each member carrying a $500 policy, using the two printed blanks which accompany this notice.

All remittances to be made by draft, postoffice or express money order, payable to "Grand Secretary and Treasurer, Ladies Society, B. of L. F. and E."

Members initiated on and after May 1, 1909, will not be liable for this assessment.

MARY E. DUBOIS,
Grand Secretary and Treasurer.

Approved:
GEORGIE M. SARGENT,
Grand President.

Note.—We enclose *two printed* blanks upon which Treasurers will make returns to the Grand Lodge for the above assessments. Both statements will be filled out *exactly* alike and sent with returns. If all names do not appear in the printed list, they will be added. If any corrections are necessary they can be made by the Treasurer. One of the printed statements, with receipt, will be returned to the Treasurer.

For the names, lodge number, cause of death, etc., of deceased sisters in the payment of whose claim this assessment is levied, see issue of the Brotherhood of Locomotive Firemen and Enginemen's Magazine, where detailed statement of the same will be given in department devoted to the Society.

THE DAVY TIP

is used on all our Out-Seam Gloves and Gauntlets. This prevents ripping at the ends of the fingers and

Makes Brotherhood Gloves the Best Gloves in the World.

If "Brotherhood" means anything to you it means that you should wear.

BROTHERHOOD GLOVES

Made by Brotherhood Men, Made for Brotherhood Men, Union Made and the Best Made. Try them.

Manufactured by DINIUS & ROWBOTTOM

J. S. DINIUS Member Lodge 237, B. of L. F. & E.	S. W. ROWBOTTOM Member Lodge 237, B. of L. F. & E.

Ask your dealer for "Brotherhood" Gloves. If he fails to supply you send for them direct to

BRADT & SHIPMAN, Sole Agents
323 Main Street **DE KALB, ILL.**

WM. B. BURFORD PRINT, IND'PLS

WINKLEY ARTIFICIAL LIMB CO.

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SOLE OWNERS.

LARGEST MANUFACTORY OF ARTIFICIAL LEGS
IN THE WORLD.

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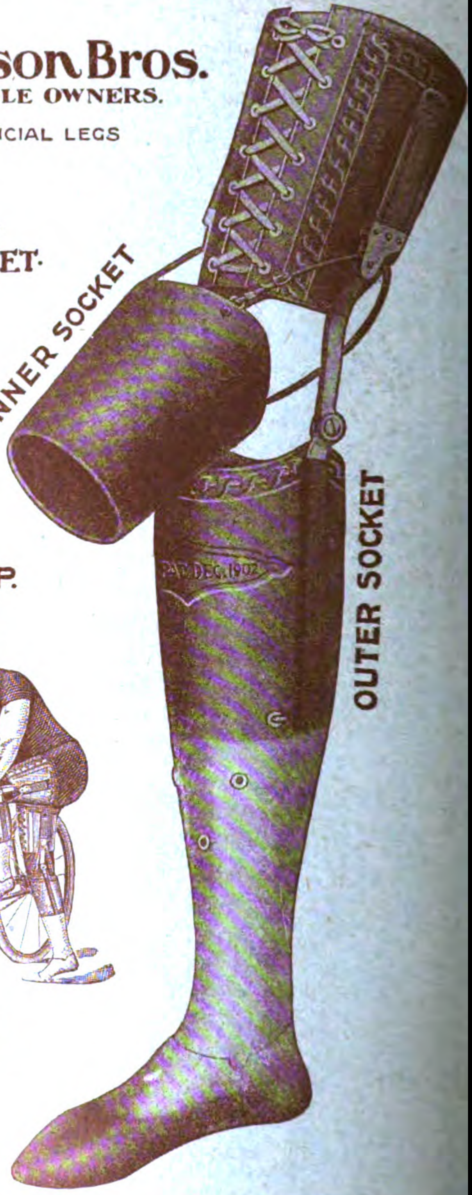
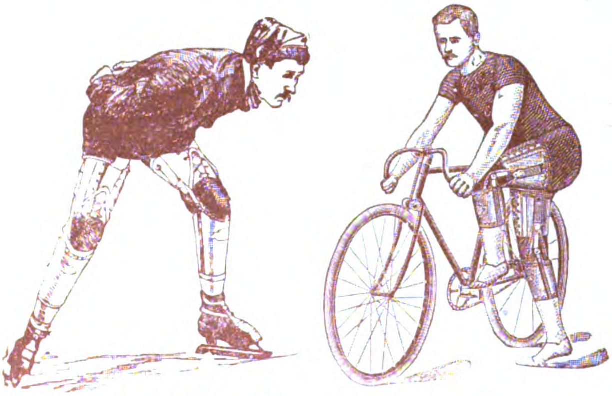
Artificial Leg

WITH
SPONGE RUBBER
MEXICAN·FELT OR ENGLISH WILLOW
Foot

WARRANTED
NOT TO CHAFE THE STUMP.





Perfect Fit Guaranteed from Measurements and Cast without leaving home.

Railroad Work is Our Specialty

Send for Our New Illustrated Catalogue

This cut shows leg for amputation six inches below the knee, with inside socket thrown out of its proper position in order to show its construction.

MINNEAPOLIS, MINN. U. S. A.

HARVARD ... MAY 28 1909 ... CAMBRIDGE, MASS.

Title page

BROTHERHOOD OF Locomotive Firemen and Enginemen's Magazine

Published at INDIANAPOLIS, IND.
by the
Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

Google

Don't Wear Clumsy Gloves

—Get Bare-Hand Deftness and Softness Combined with Perfect Protection in

Grinnell Ventilated "Rist-Fit" Gloves

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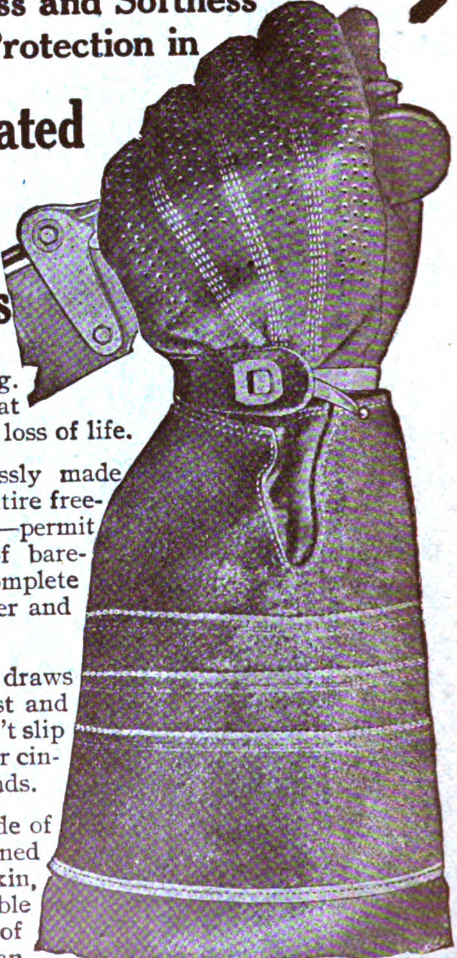

You have many lives in your keeping. One false or delayed motion would at times mean an accident and possible loss of life.

GRINNELL GLOVES are expressly made to fulfill your every need—afford entire freedom of finger play and wrist action—permit you the quickness and accuracy of barehandedness, and give you the complete protection of leather that is water and fire-proof.

One pull of the **"RIST-FIT"** strap draws your gloves closely about your wrist and holds them firmly in place—they can't slip or work down—and no dirt, grease or cinders can get in to irritate your hands.

GRINNELL GLOVES are made of the celebrated chrome-tanned "Reindeere" and Coltskin, the toughest, most flexible and best wearing of leathers. You can wash these gloves as much as you like—they will always dry out soft and pliant.

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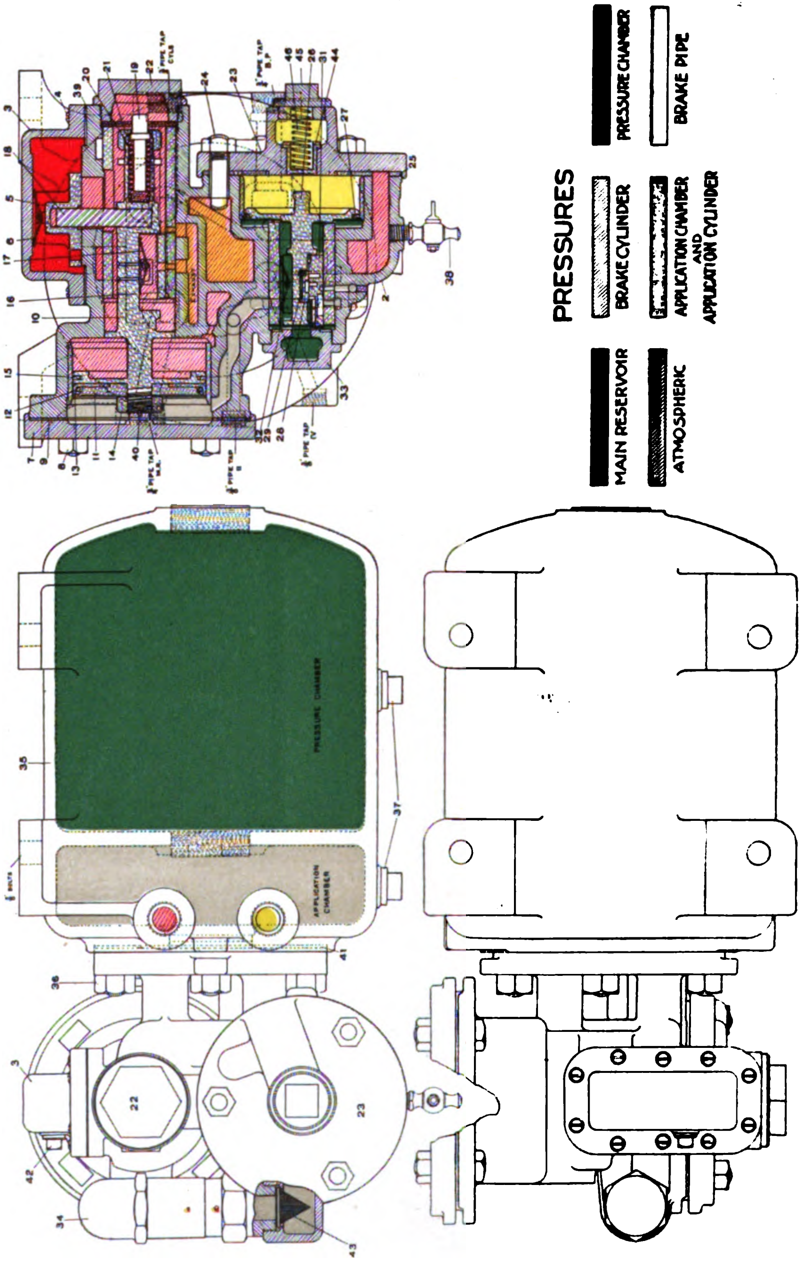

Locomotive Firemen and Enginemen's Magazine Educational Charts

WESTINGHOUSE AIR BRAKE SERIES

PLATE XLV—DISTRIBUTING VALVE AND DOUBLE-CHAMBER RESERVOIR, No. 6 ET LOCOMOTIVE BRAKE EQUIPMENT

CAMBRIDGE, MASS.

BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT
JOHN F. McNAMEE
EDITOR AND MANAGER
SUBSCRIPTION PRICE
$1.50 PER YEAR

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VOL. 46 NO. 6 INDIANAPOLIS, IND. JUNE 1909

Plate XLV—Distributing Valve and Double-Chamber Reservoir, No. 6 ET Locomotive Brake Equipment.

In the Westinghouse Air Brake Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts, the sub-series presenting the No. 6 ET Locomotive Brake Equipment has shown *diagrammatic* sectional views of the No. 6 distributing valve in all of its operating positions; and while the operating parts were shown but slightly different from their actual counterparts, some changes were necessary in order to show them all on the same plane, and to include a comprehensive view of the double-chamber reservoir and an understanding as to its connection with the operating parts of the valve section. It is now in order to show the distributing valve complete, as it is, *constructively*, and in this number of the Magazine, Plate XLV represents the Distributing Valve and Double-Chamber Reservoir, No. 6 ET Locomotive Brake Equipment.

There are three views; the upper one on the left is taken from what is generally regarded as the right-hand side of the distributing valve, showing it as it appears on the outside, but representing a section through the reservoir in transparent effect, by which the small, Application Chamber, and the larger, Pressure Chamber, and their dividing wall are shown. Also, a section is removed from the lower part of the Safety Valve and a part of that projection of the distributing-valve body to which it is attached, to give a clear view of the Safety-Valve Strainer, and the chamber in which it is contained.

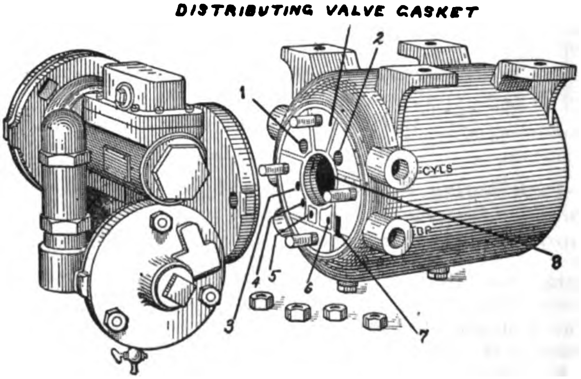
The lower, is an outside view of the Distributing Valve and Double-Chamber Reservoir as seen from above it; and the upper, right-hand view shows the Equalizing and Application portions of the Distributing Valve in sectional appearance, exactly as they are; behind which the circular outline of the Double-Chamber Reservoir is seen.

The different parts as numbered on the plate are as follows: *2*, Distributing-Valve Body; *3*, Application-Valve Cover; *4*, Cover Screw; *5*, Application Valve; *6*, Application-Valve Spring; *7*, Application-Cylinder Cover; *8*, Cylinder-Cover Bolt and Nut; *9*, Cylinder-Cover Gasket; *10*, Application Piston; *11*, Piston Follower; *12*, Packing-Leather Expander; *13*, Packing Leather; *14*, Application-Piston Nut; *15*, Application-Piston Packing Ring; *16*, Exhaust Valve; *17*, Exhaust-Valve Spring; *18*, Application-Valve Pin; *19*, Application-Piston Graduating Stem; *20*, Application-Piston Graduating Spring; *21*, Graduating-Stem Nut; *22*, Upper Cap Nut; *23*, Equalizing-Cylinder Cap; *24*, Cylinder-Cap Bolt and Nut; *25*, Cylinder-Cap Gasket; *26*, Equalizing Piston; *27*. Equalizing-Piston Packing Ring; *28*, Graduating Valve; *29*, Graduating-Valve Spring; *31*, Equalizing Valve; *32*, Equalizing-Valve Spring; *33*, Lower Cap Nut; *34*, Safety Valve; *35*, Double-Chamber Reservoir; *36*, Reservoir Stud and Nut; *37*, Reservoir Drain Plugs; *38*, Distributing-Valve Drain Cock; *39*, Application-Valve-Cover Gasket; *40*, Application-Piston Cotter; *41*, Distributing-Valve Gasket; *42*, Oil Plug; *43*, Safety-Valve Air Strainer; *44*, Equalizing-Piston Graduating Sleeve; *45*, Equalizing-Piston Graduating-Spring Nut; *46*, Equalizing-Piston Graduating Spring.

The differences between the diagrammatical views of the Distributing Valve and Double-Chamber Reservoir, and its actual appearance, are mainly in the reservoir section's really larger size than as was represented in the diagrammatic plates, and its location *behind* the valve section, instead of *below* it as shown heretofore; also, in the right-hand sectional view, it will be observed in the lower portion that the equalizing slide-valve, *31*, and its seat, and the stem of equalizing piston *26*, are much shorter than the corresponding parts in the former, colored plates; all of the ports and cavities that were shown in the elongated, diagrammatic sectional views of the equalizing valve and seat are not visible in the accompanying plate; but they are in their place, arranged in parallel, only certain ones of which could be shown no matter how the valve might be cut.

The lower portion of the valve section acts precisely as a *triple valve*, the pressure chamber of the reservoir section being the *auxiliary reservoir*, and the smaller, application chamber the (dummy) *brake cylinder;* the upper portion of the valve section is really the *distributing valve*, its principal operation being that following an automatic reduction of brake-pipe pressure, whatever pressure may occur in the application chamber as the result, it will react upon the upper, or application valve, causing it to give *an equal pressure* of main-reservoir air to the locomotive brake-cylinders; the recharge of the brake pipe operating to release the pressure from the application chamber, which in turn causes the application mechanism to exhaust the pressure from the brake cylinders. At independent applications, the application chamber receives its charge through the independent brake-valve, and the effect on the application mechanism is just the same as at an automatic application, ***the application-chamber pressure being the key to the ET locomotive-brake operation.***

The cut on this page shows the No. 6 Distributing Valve separated from its double-chamber reservoir, and gives an excellent view of the distributing-valve gasket. Nearly all of the different air-



No. 6 Distributing Valve separated from its Double-Chamber Reservoir.
Showing ports through the Distributing-Valve Gasket as follows:

1, Main-Reservoir Pressure; 2, Brake-Cylinder Pressure; 3, To Application Cylinder; 4. To Application Chamber; 5, To Distributing-Valve Release Pipe; 6, To Pressure Chamber; 7, Brake-Pipe Pressure; 8, Opening to Application Chamber (covered by the blank center of contact face of Valve Section, when the two sections are bolted together).

brake pressures on the engine and tender are ported through this gasket; there are seven regular ports, and a large hole in its center that matches the opening in the end of the application chamber. Port *1* permits the pressure from the main-reservoir supply pipe to pass into the valve section and fill the top chamber over the application valve; Port *2* represents the opening through which pressure flowing to the locomotive brake cylinders passes from the valve section to the port in the reservoir section marked in the cut "*CYLS*"; Port *3* connects the application cylinder with the application-cylinder pipe; Port *4* opens directly into the application chamber, connecting it with the lower portion of the valve section, and through ports in the equalizing slide-valve the communication is established with the application cylinder of the upper valve section, when the equalizing valve is in **release, and service-application, positions:** Port *5* connects the exhaust port of the equalizing valve (the lower, *triple-valve,* portion of the distributing valve) with the distributing-valve release pipe; Port *6* leads, in the reservoir section, to the large, pressure chamber, by a tubular passage through the application chamber, connecting in the valve section with the chamber in which the equalizing valve operates—on the left of equalizing-piston *26*; the oblong port, 7, represents the passageway between the port in the reservoir section with which the brake-pipe branch is connected—marked "*BP*" in the cut,—and the brake-pipe-pressure chamber of the lower section of the distributing valve—on the right of equalizing piston *26*; the central opening in the distributing-valve gasket, marked *8* in the cut, exposes the hole in the end of the application chamber of the reservoir section, but, as the valve section presents a full-faced central surface for contact with the reservoir section, when the two sections are bolted together the large central opening is sealed.

With the right kind of inspection, there should be no fear of any leakage from or between the ports in the distributing-valve gasket; but such leakage is not an impossibility, and the trouble that could result from the "*short circuiting*" of certain of these ports can be realized by any one who understands the duty of the pressures that pass through these several openings in the gasket. When the valve section has been seperated from the reservoir section, and the gasket removed, notice whether any part of the gasket has been torn from it and is adhering to the contact faces of either the valve—or reservoir-section; if it is, clean the iron faces smoothly, throw away the old gasket and procure a new one; before applying a distributing-valve gasket—whether an old one or a new—it is a very good plan to rub *dry* graphite on the contact faces of both sections of the distributing valve, and on the sides of the gasket, so that at future removals the parts will separate without injury to the surfaces of the gasket.

In the process of casting the reservoir section of the distributing valve, in coring the chambers it was necessary to have openings in them, intermediately, and to the atmosphere; they are shown in the center of each end of the reservoir and the inner, dividing wall; referring to the upper, left-hand view in the Educational Chart, the "outside" hole in the application-chamber end of the reservoir is closed, as has been already explained, by the gasket and valve section; and the two other openings are screw-threaded and plugged, air-tightly.

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Education of Firemen.

Under the above heading the American Engineer and Railroad Journal comments on the progressive examinations of locomotive firemen as adopted by the leading railroads of the United States as follows:

It is the practice on many roads to give the fireman an examination at the end of each year for the first three years of service. At the beginning of the year he is given a pamphlet or small book containing questions the answers to which he will be expected to be familiar with at the end of the year.

The booklet usually contains a preface stating that the fireman is invited to ask the master mechanic, roundhouse foreman and other officials for such information as he may need in preparing himself for the examination. No doubt these gentlemen will be glad to help him if he can catch them when they have the time to spare. No attempt is usually made to encourage or follow the progress of the fireman in his studies during the year, except as concerns such instructions as he may receive in the use of air brakes or on the engine. The result is that in many cases the men put the matter off until the last moment, and just previous to the time of examination lay off and start to "dig" or "cram," as it is called at college.

In some cases they have been known to hire halls and secure a young engineer or some one familiar with the subject to lecture to or quiz them. This practice is all wrong and cannot produce the best results. Some arrangement should be made so that the work and study of each individual fireman can be followed through the year. It has been suggested that correspondence school methods could be adopted. The firemen could be required to send in papers covering the answers to certain of the subjects at more or less regular intervals; these could be corrected and returned to him with suggestions and criticisms; in case the fireman desired information on any topic in connection with his work he could write in for it if he could not conveniently get it in other ways. The yearly examination would be held as at present, but the men would be much better prepared.

The "digging" or "cramming" referred to by our contemporary was a condition brought about in the past by a lack of proper educational facilities. True, there were a number of good books relating to the locomotive which described in detail the duties of the locomotive fireman and endeavored to prepare him for the more responsible duties of an engineer. Many of our most successful engineers have perfected themselves through diligent study of such books. Many more, however, have not the faculty of buckling down to painstaking research of their own volition, and right here is where the great need of patient, tireless and qualified instructors is most manifest.

For years the Magazine has endeavored to fill such a position, having on its staff of contributors some of the foremost mechanical men of the country, each an expert in his chosen field. The Magazine has endeavored in every way possible to fit the locomotive fireman for the exacting and responsible duties of his position, while gradually broadening his knowledge of the locomotive and instilling into his mind the many things so essential that he should know in order to become a successful engineer. Many such have gained promotion and are today among the most trusted locomotive engineers who owe their success to a careful study of the technical department of the Magazine.

Notwithstanding the fact that the Magazine is and has been for years the acknowledged leader in the field of technical education for locomotive firemen and engineers, the Brotherhood of Locomotive Firemen and Enginemen is not content to rest on these laurels, but true to its principles and with that spirit of progressiveness which has been one of its chief characteristics from the very day of its inception it was determined at its recent convention held at Columbus, Ohio, to extend its power and influence in the educational field by instituting its own correspondence schools. The preliminary steps have been taken, the courses are being prepared by men of long experience and who are thoroughly qualified for the work, and at the proper time due announcement will be made. The suggestion referred to by the American Engineer and Railroad Journal "that correspondence school methods could be adopted," etc., is to be a reality, and it goes without saying that it will be vastly to the benefit not only of our members who are filling the position of locomotive fireman but the employing railroads as well.

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Meeting of the International Railway General Foremen's Association.

The International Railway General Foremen's Association will meet at the Lexington Hotel, Chicago, Ill., June 1st to 5th inclusive. The sessions will begin each day at 9 a. m. and 2 p. m. A special order of business during the last forty-five minutes of each morning session will be topical discussions. Adjournment will be taken at 2:30 p. m. on the second day for the purpose of visiting the Railway Appliance Exhibition on the parlor rotunda floor of the hotel. Reports by committees will be made on the following:

1. Air brake equipment—all classes of service.
2. Coaling of engines with mechanical devices.
3. How to obtain the greatest dispatch in handling engines through terminals.
4. Installation of hot water washout and filling system.
5. Best method of getting work through shop with economy and dispatch.
6. Most approved type of ash pan conforming with requirements of Interstate Commerce Commission.

Topical Discussions.

1. Best method of arriving at cost of repairs. To be introduced by W. S. Cozad, Erie R. R., Meadville, Pa., followed

by Mr. H. D. Kelly, C. & N. W., Chicago, Ill.

2. What class of repairs should be made at outside points where facilities are limited. To be introduced by F. W. Rhuark, B. & O., Halloway, Ohio, followed by Mr. S. B. Clay, Frisco Ry., Fort Smith, Ark.

3. The use of commercial gas for heating purposes in modern shop plants in place of gasoline or crude oil. To be introduced by J. N. Davis, C. & S., Denver, Colo., followed by T. L. Drew, B. & O., Connellsville, Pa.

4. The use of oxy-acetylene process of welding fireboxes, boiler sheets, frames and other locomotive work.

5. The advantage, if any, which is derived from the use of the wide firebox over its predecessor, the narrow firebox, whether the wide firebox should be designed with a wide or narrow water leg and what should be done to overcome the present tendency to crack sheets under short periods of service. To be introduced by Lee R. Laizure, Erie, Hornell, N. Y., followed by P. F. Flavin, vice-president International Railway Boilermakers' Association, St. Louis, Mo.

6. The location of the point of water delivery in the boiler—whether it would not be an advantage to deliver water at a point six to eight inches above the mud ring, just in the rear of the throat sheet, instead of delivering at the front end of the boiler near the flues. To be introduced by W. H. Kidneigh, Santa Fe, La Junta, Colo., followed by H. J. Carrier, Erie R. R., Huntington, Ind.

The secretary of the association is Mr. E. C. Cook, Royal Insurance building, Chicago.

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Motor Car vs. Steam Locomotive Service on the Rock Island.

Under the head of "Comparative Cost of Fuel Oil Motor Car and Steam Locomotive Service on Rock Island" the Railroad Age Gazette in its issue of March 26, 1909, says:

During the months of November and December, 1908, and January, 1909, the Chicago, Rock Island & Pacific used on its Salina branch a motor car which was built by the American Locomotive Company. The run from Herington, Kan., to Salina is 49 miles. The motor car was operated 47 days during these three months, making a total mileage of 4,975 miles. The average cost of operation per mile in November was 15 cents; in December 18.5 cents and in January 20.4 cents.

In January the motor car was in service five days, and the service for the balance of the month, 26 days, was performed by a steam locomotive and train, making a total mileage of 2,548 miles, and the average cost per mile was 17.31 cents. The train was made up of one combination car and one coach, the two having a total weight of 60 tons. The locomotive was an 8-wheel engine with cylinders 18 inches by 24 inches and drivers 64 inches, weight on drivers 54,400 pounds, weight of engine 89,000 pounds, weight of engine and tender 80 tons, and the weight of engine and train 140 tons. . . . .

The total weight of the car is 100,000 pounds, weight on drivers 32,400 pounds, the cylinders are compound 9¼ inches, and 14½ inches by 12 inches stroke. The boiler is of the return tubular type with working pressure 250 pounds. Its total heating surface is 624 square feet, and it is furnished with a superheater. The maximum power of the engine is 250 horsepower. The car is 55 feet 9 inches long. It has engine and baggage compartments and a seating capacity for 40 passengers. Much of the time the motor hauled the coach as a trailer, and the total weight was then 130 tons, but the oil consumption was not materially increased over that of the motor car alone.

The table below gives in detail the items making up the cost per mile of the motor car performing 20 days' service in November, 1908, when it made a total mileage of 2,325 miles, compared with the locomotive and train, which performed 26 days' service in January, 1909, and made a mileage of 2,548 miles.

	—Average cost per mile.—	
	Motor car. 20 days. Nov., 1908.	Loco. and train. 26 days. Jan., 1909.
Fuel oil	3.35 cts.	5.64 cts.*
Wages, enginemen	3.15 "	6.80 " †
Wages, conductor	2.15 "	2.48 "
Running repairs	4.13 "	0.51 "
Cleaning	0.96 "	0.57 "
Roundhouse service	0.62 "	0.57 "
Miscellaneous supplies	0.56 "	0.56 "
Oil and waste	0.21 "	0.18 "
Total	15.13 cts.	17.31 cts.

---

*Coal.

†Fireman included.

It is now intended to further experiment with the motor car on a short stub run of 5 miles with frequent service between Atchison and Rushville.

The above table of comparative average operative costs per mile as between the motor car and the steam locomotive can hardly be considered as fair to the locomotive, for it will be noted that the 20 days of November only, in which the average cost per mile for the motor car was the lowest, is compared with the 26 days in January that the steam locomotive was in service.

Taking the average cost of operation for the 47 days in the months of November, December and January that the motor car was in service it will be found to amount to 17.96 cents per mile as against the 17.31 cents per mile for the 26 days that the steam locomotive was in use. From the foregoing the only apparent advantage of the motor car over the steam locomotive is in the use of oil for fuel, whereby the annoyance from smoke is greatly mitigated if not eliminated.

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The Wendling Fish Plate.

Illustrations are shown herewith of a new fish plate for railroad tracks which has recently been invented and patented by Mr. George Wendling, of Dayton, Ohio.

Fig. 1.

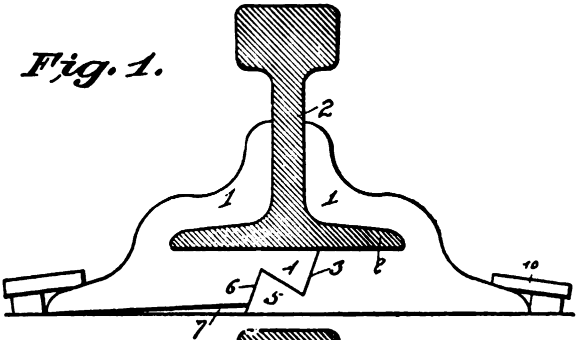
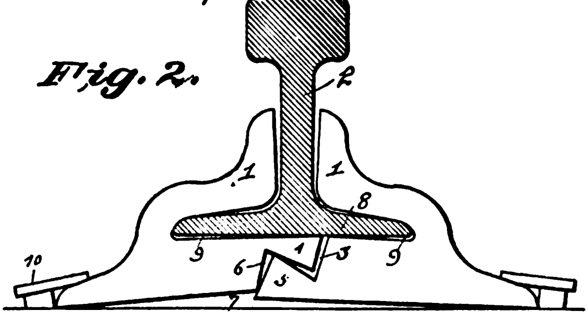


Fig. 2.



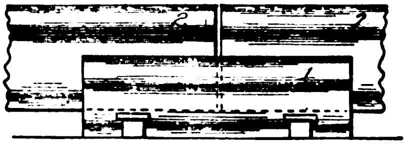


Fig. 3.

The Wendling Fish Plate

As will be noted, the fish plate on each side of the rail joint is provided with engaging members which in their normal position, Fig. 2, do not bind each other, but when weight is placed on the rail, as when a train is moving over same, the effect of such pressure is to cause the interlocking portions of the fish plates to firmly engage each other (see Fig. 1), the weight on the rail maintaining such engagement and causing the fish plates to securely bind the rail flange and the sides of the upright portion of the rail.

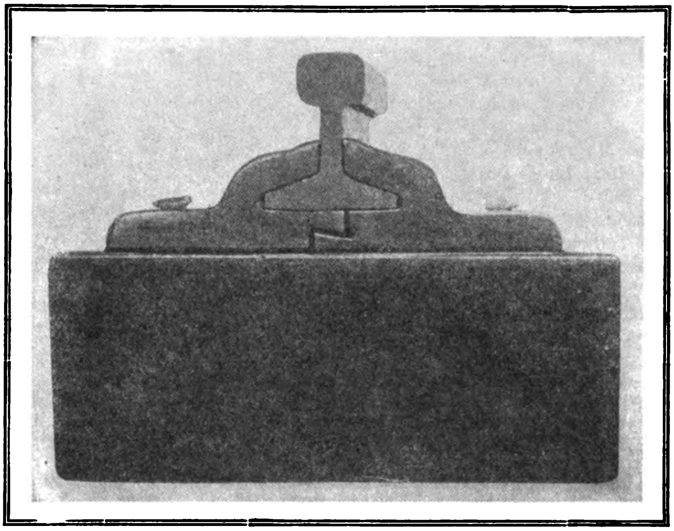
Fig. 3 is a side elevation of the joint, showing the fish plates in position and the rails free to expand. The half-tone view shows how the rail is held in place and the plates interlocked. The following description is taken from a circular issued in reference to this invention:

The fish plates *1 1* are made in two separate parts, each of which has a certain amount of resiliency, and both of which are secured to the ties by the usual spikes *10*. The said fish plates have slots or openings *9*, extending inwardly and of suitable size to receive the base flange *8* of the rail *2*, said slots being of a size to snugly enclose the base flange of the rail when weight is placed upon the rail and to snugly embrace the upright flange of said rail. The lower portions of the fish plates extend inwardly below the base flange *8* of the rail and terminate at their inner edges in male and female interlocking tongues and recesses *3*, *4*, *5* and *6*. The depth of one of these base portions of the fish plates is less than the depth of the other, so that there is a space, 7, provided between the cross ties and said base portion, which forms an important feature of the device; for example, the pressure upon the rail due to a train passing thereover, is exerted equally upon these base portions of the fish plates, and the weight or pressure exerted upon that fish plate which has its base of less depth than the other, will all be directed upon the interlocking tongues *4* and *5*, to cause them to firmly engage at all points of their surfaces the recesses *3* and *6*, and to thus bind the fish plates firmly around the base flange of the rail and against the opposite sides of the upright flange of the rail.

As is seen in Fig. 2, there is no weight upon the rail *2* and as a consequence, the fish plates *1 1* are more or less flexible or loose in their connection, and the interlocking tongues and recesses in the bases of the fish plates are separated to a sufficient extent, owing to the absence of weight upon the rail, to allow the fish plates to loosen their contact with the rail and to thus permit the rail to have independent movement under the effects of different temperatures.

It will be seen that the parts are entirely closed up in Fig. 1; this is the condition when weight is placed upon the rail. Fig. 2 is designed to clearly illustrate that, when weight is removed from the rail there is no clamping or binding effect between the interlocking tongues of the fish plates or between the fish plates and the sides of the rail. This view of the drawings is intended to illustrate this condition of looseness or flexibility by showing space between the sides of the rail and the fish plates and between portions of the interlocking tongues of the fish plates. The space 7 below the base of one of the fish plates is always there, though such space is less when the fish plates are clamped by weights being on the rail. It will be readily seen that if one of the fish plates were not provided with a base of less depth than the other, the bases of both plates would rest in contact with the ties and the weight of the train in passing over the rails could not be utilized for the purposes of binding the fish plates in contact with the rail to secure the joint at a time when security is most needed, for example, when a train is passing over the joint.

All communications relative to the above described invention should be addressed to The Wendling Fish Plate Co., National Theatre Bldg., Dayton, Ohio.



The Wendling Fish Plate—Showing how rail is held and plates interlocked

Eighth Session of the International Railway Congress.

The Swiss federal council having sanctioned the invitation to hold its next session on Swiss soil, the International Railway Congress Association will hold its eighth session at Berne, Switzerland, July 3 to 16, 1910.

A managing board consisting of 57 members, a president and two vice-presidents, with the temporary addition of a Swiss section of 12 for the purpose of organizing the forthcoming session, forms the permanent commission of the congress. There are nine American members of the permanent commission, as follows: Stuyvesant Fish, Missouri Pacific; Frank Barr, Boston & Maine; Howard Elliott, Northern Pacific; Theodore N. Ely, Pennsylvania Lines; Fairfax Harrison, Southern; Charles M. Hays, Grand Trunk; J. Kruttschnitt, Southern Pacific; L. F. Loree, Delaware & Hudson, and G. W. Stevens, Chesapeake & Ohio. A. Dubois, of the Belgian State Railways, is president, and Alfred Picard, minister of marine of France, and C. Ramaeckers, of the Belgian State Railways, are vice-presidents.

Discussions upon questions enumerated under the following heads, to each of which has been assigned a reporter, will form the deliberations of the congress:

Section I.—Way and Works.

1. Rail Joints.—M. Chateau, Western of France; M. Kramer, Hungarian State Railway; Alexander Ross, Great Northern (England); M. Frahm, Royal Prussian Railways.

2. Strengthening Track and Bridges.—Herman Rosche, Ausig-Teplitz (Austria); M. L. Byers, Missouri Pacific; R. Coderch, Madrid & Saragossa (Spain); M. Maurer, Hungarian State Railways; P. A. Zahariade, Roumanian State Railways; E. Randich, Italian State Railways; J. Schroeder van der Kolk (Hague); M. Belelubsky (Russia); J. W. Jacomb-Hood, London & Southwestern; M. Frahm and M. Labes, Royal Prussian Railways (Berlin).

3. Junctions and Swing Bridges.—M. Tettelin and M. Cossmann, Northern Railway of France; C. L. Morgan, London, Brighton & South Coast; W. G. Besler, Central Railroad of New Jersey; L. Motte, Belgian State Railways.

4. Long Tunnels.—F. Sartiaux, Northern of France; F. Hennings (Switzerland); Francis Fox (England); M. Canat, Paris, Lyons & Mediterranean.

Section II.—Locomotive and Rolling Stock.

5. The Use of Steel.—D. F. Crawford, Pennsylvania Lines West; E. Szlabey, Hungarian State Railways; R. L. Ettenger, Southern Railway; O. Honigsberg, Austria Southern; Wilson Worsdell, Northeastern (England); M. Le Blant, Eastern of France.

6. Improvements in Locomotive Boilers.—N. Antochine (Russia); H. H. Vaughan, Canadian Pacific; M. Gerstner (Austria-Hungary); G. Noltein, Moscow; C. Dassesse, Belgian State Railways; J. Papp, Hungarian State Railways; M. Nadal, Eastern of France; C. B. Dudley, Pennsylvania; H. Fowler and L. Archbutt, Midland Railway (England); K. Steinbiss, Royal Prussian.

7. High-Speed Locomotives.—William Garstang, Cleveland, Cincinnati, Chicago & St. Louis; M. Courtin (Karlsruhe).

8. Electric Traction.—Dr. Gleichmann (Munich); George Gibbs, Long Island Railroad; Dr. Wyssling (Zurich).

Section III.—Working.

9. Large Stations.—H. A. Jaggard. Pennsylvania Railroad; A. Kain, Hungarian State Railways; M. Julien and M. Leverve, Orleans (France).

10. Operation of Switches and Signals.—L. H. N. Du Four, Netherlands State Railways; Dr. Ulbright (Dresden); E. C. Carter, Chicago & Northwestern; L. Weissenbruch and J. Verdeyen, Belgian State Railways.

11. Passenger Tickets.—Director Von Stierlin, Wurtemberg State Railway, Stuttgart.

12. Motor Vehicles.—T. H. Riches, Taff Vale (Wales); C. P. Clark, Buffalo & Susquehanna; L. Greppi, Italian State Railways.

Section IV.—General.

13. G. R. Jebb (Birmingham, England); W. E. Hoyt, special engineer (New York Central Lines); C. Colson, French Government Railways.

14. Statistics.—W. M. Acworth (London); Sir Thomas Rees Price, Central South African Railways; E. F. Knibloe, Buffalo Creek Railway; M. De Geynst, Belgian State.

15. Motor Car Services.—J. C. Inglis, Great Western (England).

16. Perishable Freight.—J. M. Culp,

Southern Railway; M. Bloch, Orleans Railway (France).

Section V.—Light Railways.

17. Branch Lines.—M. Quarre, Midi Railway (France).
18. Working of Light Railways.—M. Plocq (France).
19. Locomotives and Rolling Stock of Narrow Gauge Light Railways.—M. Jesser, Austria Southern.
20. Transshipment.—C. De Burlet, Belgian State Railways.
21. Freight Car Interchange and Demurrage.—W. F. Allen, secretary American Railway Association.

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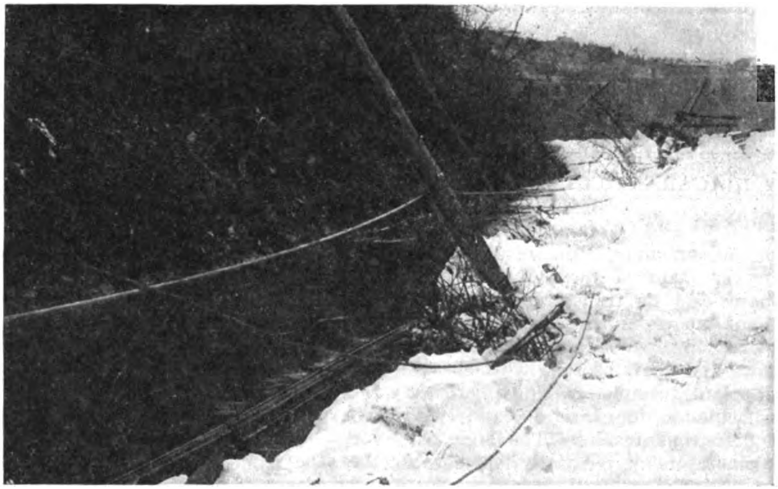
*Great Gorge Electric Railway Buried Under 20 Feet of Ice.**

One of the accompanying illustrations shows the Great Gorge Electric Railway buried under thousands of tons of ice during the recent ice jam in lower Niagara River. It may be stated that on April 9th and 10th the conditions of ice, wind and water at Niagara Falls were such as to produce an ice jam in the lower river which has never before been equalled.

This shut down the hydro-electric power plants of the Ontario Power Company and the Niagara Falls and Hydraulic Power Manufacturing Company below the falls, as they were partially submerged and could not operate the electric generators supplying power to electro-chemical plants at the falls and transmitted to Toronto and other Canadian cities, as well as to Rochester and Syracuse on the American side.

It will be remembered that the heavy and continuous winds up the lakes in February resulted in holding back the waters on Lake Erie and causing the phenomenal dry Niagara Falls which provided so much trouble for the hydro-electric power plants above the falls.



GREAT GORGE ELECTRIC RAILWAY IN NIAGARA ICE JAM

The great ice jam was caused by the severe winds of the second week in April rushing up the Niagara Gorge. The conditions combining to produce this effect were the high water in the upper river carrying large quantities of ice over the falls, and the heavy winds being in the proper direction to hold the ice back in the lower river.

The wind sweeping up the ravine caused the vast quantities of ice passing under the bridge and through the rapids and whirlpool to become wedged against the banks at Lewiston and Queenstown, forming a dam which raised the level of the water 40 or 50 feet above the normal, and 20 or 25 feet higher than ever before recorded.

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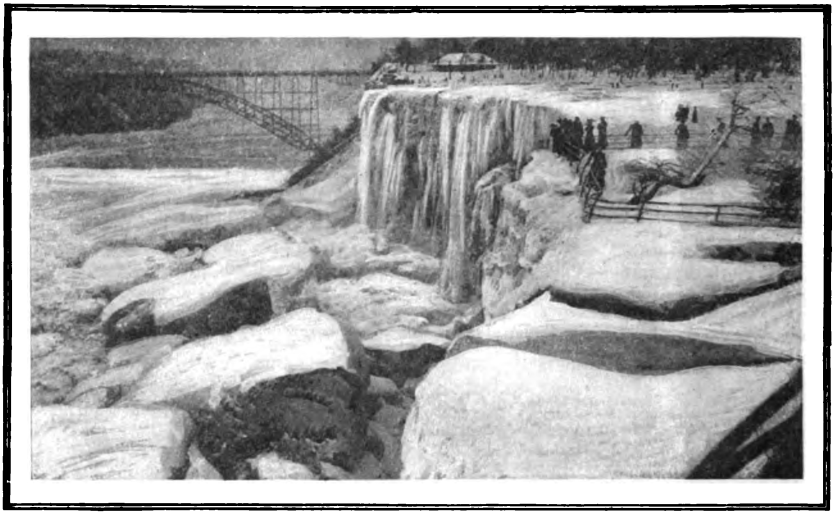
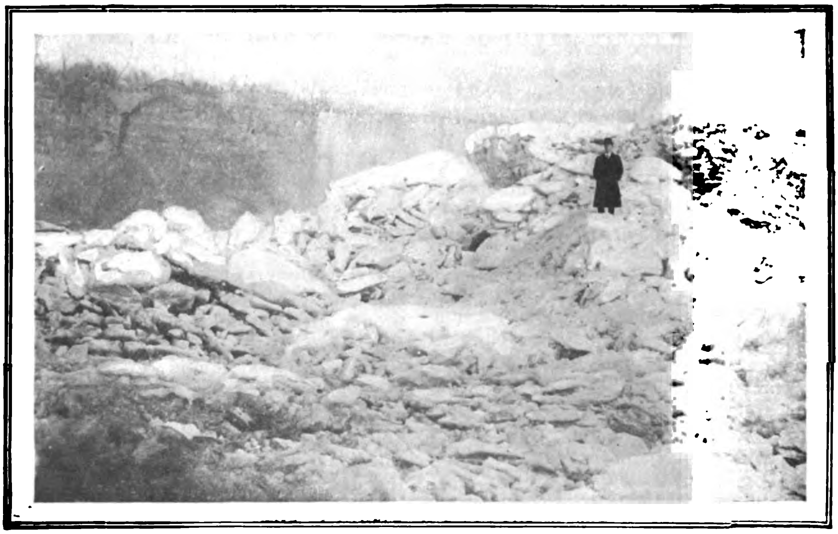
*By Frank C. Perkins.



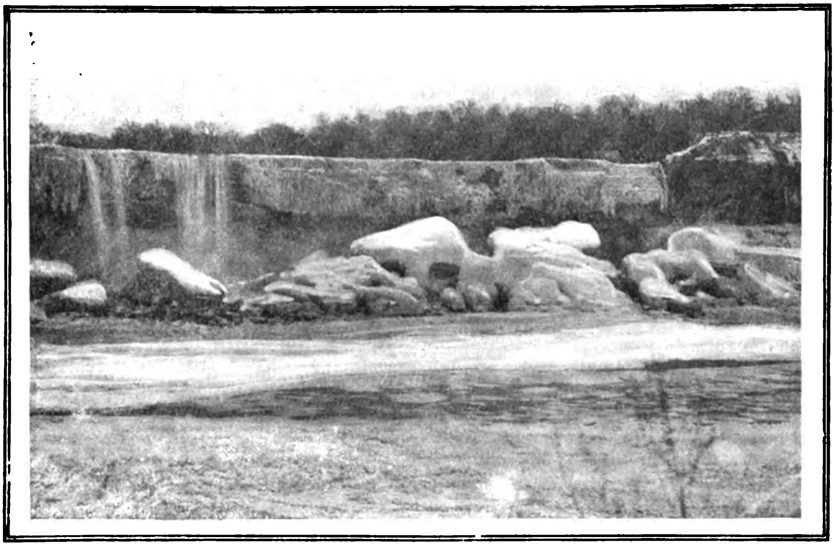
DRY NIAGARA FALLS, DUE TO WIND HOLDING BACK WATERS OF UPPER RIVER

The accompanying illustrations show the power plant of the Ontario Power Company and its transformer house on the bank above on the Canadian side. The water rose so high as to enter the windows and doors of this hydro-electric power plant, completely shutting down the machinery for several days, with most disastrous results. The high tension generators were partly submerged and, although the damage to the plant was not permanent, the electrical machinery was put out of commission so that power service on the transmission lines on the American as well as the Canadian sides was discontinued for a time.

Immediately arrangements were made for a high tension current supply from the other Canadian power plants above



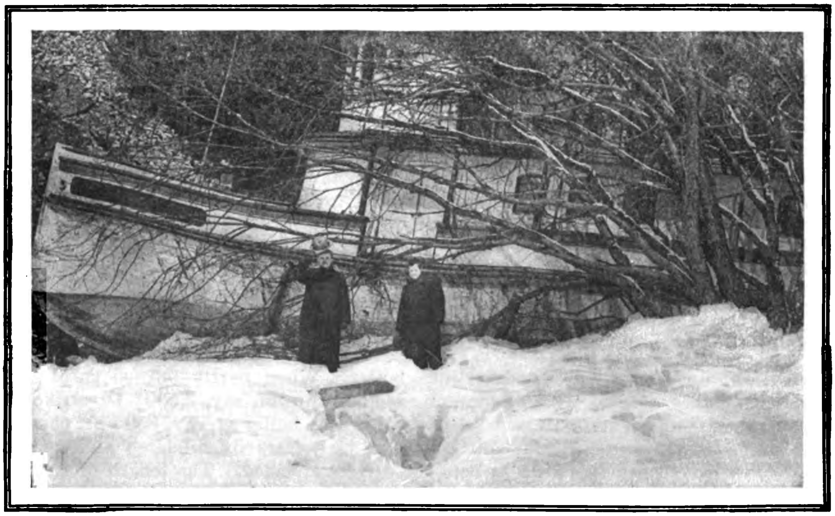
NIAGARA ICE JAM 50 TO 60 FEET HIGH



DRY NIAGARA, DUE TO HEAVY WINDS HOLDING BACK WATERS OF UPPER RIVER

the falls for temporarily supplying the Canadian power users, while on the American side the 10,000 horsepower gas engine power plant of the Lackawanna Steel Company was utilized for operating the Buffalo and Hamburg Electric Railway, as well as for supplying other power users of the Ontario Power Company between Niagara and Rochester.

The ice jam at the falls and the river filled with thousands of tons of ice may be seen in the accompanying illustrations. The ice was piled 50 feet high on the Canadian side below the falls and the electric incline railway was wrecked in the ice jam. The Maid-of-the-Mist was carried high and dry and its dock completely wrecked, the entire river being



MAID OF THE MIST IN NIAGARA ICE JAM

filled with a mass of ice 50 to 60 feet thick.

It was thought that the Niagara River bridges would be carried away on account of the ice jamming into and far above the piers or abutments. The Great Gorge Electric Railway on the American side was completely buried beneath 20 feet of ice, its pole line and trolley wires wrecked and the tracks badly damaged.

The extent of the damage can hardly be estimated until the tracks are cleared and the ice passes out of the river. An ordinary ice bridge across the river just below the falls is a wonderful attraction during winters which are severe enough to cause the ice to form across from one dock to the other where the Maid-of-the-Mist usually operates in summer. However, never before has it been possible to cross the river on the ice at the rapids as has been done during this ice jam.

Many fishing shacks were overturned by the ice as it passed down the river, and the wreckage of the Niagara Gorge Electric Railway at the whirlpool rapids and devil's hole not far from Lewiston, was complete. The worst damage caused by this ice jam was undoubtedly at Lewiston and Queenstown, where many buildings were destroyed, as well as the docks and electric railway tracks. The railway lines were not only buried under 15 feet of ice and debris, but great havoc resulted along the shores of the lower Niagara River the entire distance from the falls to Niagara-on-the-Lake. The docks at the mouth of the river at Lake Ontario and Niagara-on-the-Lake were badly damaged, as well as all the fishing shacks on the river banks.

It is stated that the Ontario Power Company has decided to close the windows and doors with concrete and masonry, so that in the future no interruptions of the electric power service can occur, and after drying out the high tension coils of the generators little or no permanent injury was found.

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Smokeless Combustion of Coal.

A bulletin on the smokeless combustion of coal in boiler plants, with a chapter on central heating plants, will soon be issued by the United States Geological Survey, Technologic Branch, giving in detail a study of the conditions found in industrial establishments in thirteen of the largest cities of Indiana, Illinois, Kentucky, Maryland, Michigan, Missouri, New York, Ohio and Pennsylvania, between 400 and 500 plants having been inspected. Sufficient information was collected to make the data from 284 plants of value for this report.

The bulletin, prepared by D. T. Randall and H. W. Weeks, not only shows that bituminous coals high in volatile matter can be burned without smoke, but also that large plants carrying loads that fluctuate widely, where boilers over banked fires must be put into service quickly and fires forced to the capacity of their units can be operated without producing smoke that is objectionable. Proper equipment, efficient labor, and intelligent supervision are the necessary factors.

The burning of coal without smoke is a problem which concerns the Government directly because of the advantages of smokeless combustion both in public buildings and on naval vessels. In addition, smoke abatement is a factor in conserving the fuel resources of the United States, hence, as a part of its general investigation of the best methods of utilizing the coals of this country, the United States Geological Survey has made extended tests to determine the conditions necessary for the smokeless combustion of bituminous coal in boiler plants.

The general conclusions of Messrs. Randall and Weeks are as follows:

Smoke prevention is possible. There are many types of furnaces and stokers that are operated smokelessly.

Credit is to be given to any one kind of apparatus only in so far as the manufacturers require that it shall be so set under boilers that the principles of combustion are respected. The value of this requirement to the average purchaser lies in the fact that he is thus reasonably certain of good installation. A good stoker or furnace poorly set is of less value than a poor stoker or furnace well set. Good installation of furnace equipment is necessary for smoke prevention.

Stokers or furnaces must be set so that combustion will be complete before the gases strike the heating surface of the boiler. When partly burned gases at a temperature of, say, 2,500° F., strike the tubes of a boiler at, say, 350° F., combustion is necessarily hindered and may be entirely arrested. The length of time required for the gases to pass from the coal to the heating surface probably averages considerably less than one second, a fact which shows that the gases and air must be intimately mixed when large volumes of gas are distilled, as at times of hand firing, or the gas must be distilled uniformly, as in a mechanical stoker. By adding mixing structures to a mechanical stoker equipment both the amount of air required for combustion and the distance from the grates to the heating surface may be reduced for the same capacity developed. The necessary air supply can also be reduced by increasing the rate of combustion.

No one type of stoker is equally valuable for burning all kinds of coal. The plant which has an equipment properly designed to burn the cheapest coal available will evaporate water at the least cost.

Although hand-fired furnaces can be operated without objectionable smoke, the fireman is so variable a factor that the ultimate solution of the problem depends on the mechanical stoker—in other words the personal element must be eliminated. There is no hand-fired furnace from which, under average conditions, as good results can be obtained as from many different patterns of mechanical stoker; and of two equipments the one which will require the less attention from the fireman gives the better results. The most economical hand-fired plants are those that approach most nearly to the continuous feed of the mechanical stoker.

The small plant is no longer dependent on hand-fired furnaces, as certain types of mechanical stokers can be installed under a guaranty of high economy, with reduction of labor for the fireman.

In short, smoke prevention is both possible and economical.

During 1904 to 1906 coals from all parts of the United States were burned at the Government Fuel Testing Plant at St. Louis, in furnaces which were in the main of the same design. Most of the tests were made on a hand-fired furnace under a Heine water-tube boiler. The lower row of tubes of the boiler supported a tile roof for the furnace, giving the gas from the coal a travel of about twelve feet before coming into contact with the boiler surface. This furnace is more favorable to complete combustion than those installed in the average plant. A number of coals were burned in this furnace with little or no smoke, but many coals could not be burned without making smoke that would violate a reasonable city ordinance, when the boiler was run at or above its normal rated capacity.

In 1907 the steaming section of the St. Louis plant was moved to Norfolk, Va., where subsequent tests of this nature were made. The plant at Norfolk was equipped with two furnaces—one fired by hand and the other by a mechanical stoker.

In the course of the steaming tests some special smoke tests were made and the influence of various features in smoke production was noted. As the tests were made as far as possible under standard conditions with a minimum variation in boiler room labor the results bring out the importance of other factors, such as character of fuel and furnace design.

A brief summary of the general conclusion is as follows:

A well-designed and operated furnace will burn many coals without smoke up to a certain number of pounds per hour, the rate varying with different coals, depending on their chemical composition. If more than this amount is burned, the efficiency will decrease and smoke will be made, owing to the lack of furnace capacity to supply air and mix gases.

High volatile matter in the coal gives low efficiency and vice versa. The highest efficiency was obtained when the furnace was run at low capacity. When the furnace was forced the efficiency decreased.

With a hand-fired furnace the best results were obtained when firing was done most frequently, with the smallest charge.

Small sizes of coal burned with less smoke than large sizes, but developed lower capacities.

Peat, lignite, and sub-bituminous coal burned readily in the type of tile-roofed furnace used, and developed the rated capacity with practically no smoke.

Coals which smoked badly gave efficiencies 3 to 5 per cent. lower than the coals burning with little smoke.

Briquets were found to be an excellent form for using slack coal in a hand-fired plant. They can be burned at a fairly rapid rate of combustion with good efficiency and with practically no smoke. High-volatile coals are perhaps as valuable when briquetted as low-volatile coals.

A comparison of tests on the same coal washed and unwashed showed that under the same conditions the washed coal burned much more rapidly than the raw coal, thus developing high rated capacities. In the average hand-fired furnace washed coal burns with lower efficiency and makes more smoke than raw coal. Moreover, washed coal offers a means of running at high capacity, with good efficiency, in a well-designed furnace.

Forced draft did not burn coal any more efficiently than natural draft. It supplied enough air for high rates for combustion, but as the capacity of the boiler increased the efficiency decreased and the percentage of black smoke increased.

Most coals that do not clinker excessively can be burned with 1 to 5 per cent. greater efficiency and with a smaller percentage of black smoke on a rocking grate than on a flat grate.

Air admitted freely at firing and for a short period thereafter increases efficiency and reduces smoke.

As the CO in the fuel increases the black smoke increases; the percentage of CO in the flue gas is therefore, in general, a good guide to efficient operation. However, owing to the difficulty of determining this factor, combustion cannot be regulated by it.

The simplest guide to good operation is pounds of coal burned per square foot of grate surface per hour.

None of the problems of combustion have received more experimental treatment than the burning of coal in hand-fired furnaces. Hundreds of devices for smokeless combustion have been patented, but almost without exception they have proved failures. This record may be explained by the fact that many of the patentees have been unfamiliar with all the difficulties to be overcome, or have begun at the wrong end. Numerous patents cover such processes as causing the waste gases to re-enter the furnace, and schemes for collecting and burning the soot are legion. So many manufacturers who have been looking for some cheap addition to a poorly constructed furnace to make it smokeless have experienced inevitable failure that the work of educating the public to rid cities of the smoke nuisance has been hard, long, and only partly successful.

The total number of steam plants having boilers fired by hand is far greater than the total of plants with mechanical stokers, but if the comparison is based on total horsepower developed the figures show less difference. Particularly is this true in sections of the Central West, where mechanical stokers are generally used at large plants. As a general rule, hand-fired plants do not have proper furnaces, and methods of operation are far from conducive to good combustion. Coal is usually fired in large quantities, and little opportunity is given for the air and gases to mix before the heating surface is reached and combustion is arrested. In all the hand-fired plants visited success in smoke prevention has been obtained chiefly by careful firing. The coal was thrown on often in small quantities; the fire was kept clean, enough ash to prevent the passage of air through the fire never being allowed to collect on the grate; and more air was supplied at firing than after the volatile matter had been distilled. Even with such precautions the plants might have made objectionable smoke at times, but for the fact that usually some method was employed for mixing the gases and air before they reached the heating surface.

Some general conclusions from the facts set forth in the bulletin are as follows:

The flame and the distilled gases should not be allowed to come into contact with the boiler surfaces until combustion is complete.

Fire-brick furnaces of sufficient length and a continuous or nearly continnous supply of coal and air to the fire make it possible to burn most coals efficiently and without smoke.

Coals containing a large percentage of tar and heavy hydro-carbons are difficult to burn without smoke and require special furnaces and more than ordinary care in firing.

Briquets are suitable for use under power-plant conditions when burned in a reasonably good furnace at the temperatures at which such furnaces are usually operated. In such furnaces briquets generally give better results than the same coal burned raw.

In ordinary boiler furnaces only coals high in fixed carbon can be burned without smoke, except by expert firemen using more than ordinary care in firing.

Combinations of boiler-room equipment suitable for nearly all power-plant conditions can be selected, and can be operated without objectionable smoke when reasonable care is exercised.

Of the existing plants some can be remodeled to advantage. Others cannot, but must continue to burn coals high in fixed carbon or to burn other coals with inefficient results, accompanied by more or less annoyance from smoke. In these cases a new, well-designed plant is the only solution of the difficulty.

Large plants are, for obvious reasons, usually operated more economically than small ones, and the increasing growth of central plants offers a solution of the problem of procuring heat and power at a reasonable price and without annoyance from smoke.

The increasing use of coke from by-product coke plants in sections where soft coal was previously used, the use of gas for domestic purposes, and the purchase of heat from a central plant in business and residence sections, all have their influence in making possible a clean and comfortable city.

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Increase in Use of Wood Preservatives.

Importations of oil of coal tar, or creosote, as it is popularly known, increased from 3½ million gallons in 1904, to an amount estimated to be almost 25 million gallons last year. The major portion of this gain is due to the increasing use of the material as a preservative of railroad ties, mine props, telephone and telegraph poles, fence posts, and for timbers used for other commercial purposes. Formerly the production of creosote, from both coal tar and wood tar, far exceeded any demand for wood treating purposes. However, the number of wood-preserving plants has grown so rapidly within the last four years that this country is now able to supply its own demand for coal tar creosote. A brief study of the importation columns of the trade journals shows the effect of the growth of the wood preservation industry. In the whole year of 1904, as has been stated, the New York imports amounted to only 3,500,000 gallons. By the end of 1907, the importation had increased to 17,500,000 gallons, while for the present year conservative estimates place the imported coal tar creosote at between 22 to 25 million gallons. The year has started most auspiciously; during a five weeks' period in December and January the importation through New York alone was 15,000 tons, giving a weekly average of 3,000 tons or 68,000 gallons. The production of creosote in this country will, in all probability, continue to be far less than the consumption. The wood preservation industry has been in its infancy only, and enormous demands may be expected in the future. The coke, and consequently the coal tar industries, have until recently been at their best, but even at their best the supply of by-products has run short. On this account, we should turn to other sources to supply the increasing demands for creosote preservatives. A great help may be eventually afforded by the increasing use of wood tar creosote, which has not been in high favor in the past. It is gratifying to note that within the last few years some of the more important wood distillers have been turning into a profit those oils and tars which were formerly run to waste. The demand for these products is increasing, and this recovered by-product has been asserted to be not only a revenue for the producer, but also a valuable preservative for the treatment of structural timber.—The Railway and Engineering Review.

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*The Block Signal and Train Control Board.**

Part III.

This part of the report contains miscellaneous data collected by the committee while pursuing the main purpose of its investigation, and comprises brief notes in regard to devices or systems that have to do with the safety of railway operation.

A. CONTROLLED MANUAL BLOCK SYSTEM.

While the English roads evidently have, as a whole, the best of signalmen, a number of companies have nevertheless introduced electric-control apparatus by which the men at the opposite ends of a block must co-operate in giving a clear signal. Whether from a knowledge of errors which have occurred but which have caused no collisions and have not been made public, or from the desire to provide all possible safeguards, regardless of the smallness of the percentage of errors occurring when these refinements of safety are not employed, or from an inclination to satisfy a real or fancied demand on the part of the public, these roads have taken action which indicates that their past records, good as they have been, are not entirely satisfactory. Among the roads which have done this are the London and South Western, the Great Northern and the North Eastern.

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*Extracts from first annual report of the Block Signal and Train Control Board to the Interstate Commerce Commission, dated November 20, 1908. —Continued from May, 1909, Magazine

The South Eastern and Chatham Railway and the London, Brighton and South Coast Railway have had a controlled manual block system in use for a long time. Almost all single-track lines in Great Britain are worked by the staff system, this being a fully developed electric system giving a high degree of protection through electric control exercised over the manual operation of the block signals. The Caledonian Railway on its Callander and Oban line has for several years used a high-speed electric staff and tablet system, which is still satisfactorily operated, though it is ascertained that most of the trains stop at all stations, the tablets being exchanged by hand. On some of the lines, however, where faster trains are run, the device for catching and delivering the tablets at speed is in successful use.

Automatic Block Signaling.—Some installations of automatic block signals exist in Europe, particularly those of the Hall inclosed disk type used in France, but the only automatic block-signal installations examined were those of the Hall normal danger electro-gas automatic signals on the ten and one-half miles of double track between Alne and Thirsk on the North Eastern Railway, and the low-pressure pneumatic installation on the London and South Western four-track in the suburban territory outside London.

These installations cover the only important or extensive use of the continuous electric track circuit on British steam surface roads. To one familiar with the rapid increase in the use of the track circuit for signal control in America it is remarkable to note the slight extent to which it is used in Great Britain. The chief properties of value in an electric track circuit are the ability to detect by its use the presence of a single car or even a single truck or pair of wheels upon the circuit, or a broken or removed rail in the circuit, and the control of signals by the position of switches in the block.

The percentage of broken rails on English railroads is small as compared with that on American roads. The question of switch protection is probably of equal

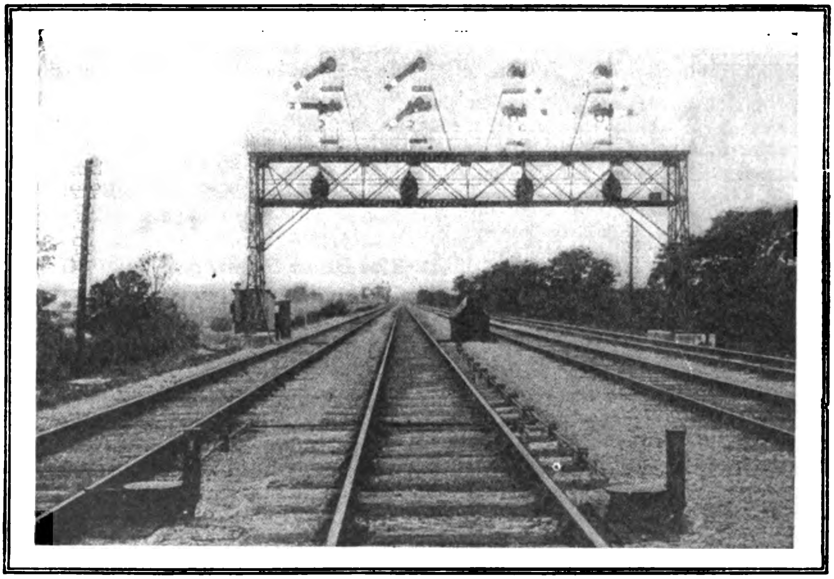

Fig. 2. Signal bridge between Hook and Winchfield, London and South Western Railway, showing low pressure pneumatic automatic block signals, typical track, telegraph line construction, and Clayton fogging machine with torpedo placed on rail to repeat audibly the caution indication of the distant signal. Traffic runs left handed, signal arms are displayed to the left of the mast as viewed from an approaching train. Note complete handrail protection for lampmen and reflecting lamps on distant signals

moment in the two countries. On the other hand, however, while in American practice continuous brakes are used on by far the greater proportion of cars in all freight trains, scarcely any continuous brakes are used on goods equipment in Great Britain. The use of continuous brakes by causing an application of the brakes whenever adjacent cars are separated, as by the train breaking in two, constitutes a considerable safeguard in block-signal operation by insuring the detection of the accidental or unauthorized separation of vehicles from a train, and hence the detection of vehicles that might be left in a block after the main portion of the train had passed out of the block. The nonuse of continuous brakes on British freight trains would seem to constitute a good argument for the use of track circuits in the signaling of British railways. Investigation of the subject, however, shows that numerous difficulties which are not encountered in American practice beset English railway officers in the use of track circuits, as follows:

1. The very light weight of a considerable portion of the English goods wagons. Most of these cars have a capacity of from 7 to 10 tons, though the number of wagons of 20-tons capacity is being increased.

2. The brakes on English goods wagons are seldom applied except while the vehicle is standing on a siding or being shunted in a yard, the ordinary service braking of the train being accomplished by the use of the engine brakes and the brake in the guards' van on the rear of the train. In the common type of English goods wagon the brake is applied through a long lever, the trainman generally standing upon the lever in order to apply the brake. As a rule, brakes are used on one side of the car or wagon only. This infrequent braking of goods-wagon wheels permits the formation of a sort of glaze upon the tires which is so low in conductivity that the pressure of the wheels upon the rails is hardly sufficient to reliably shunt the track-battery current of a track circuit away from its relay.

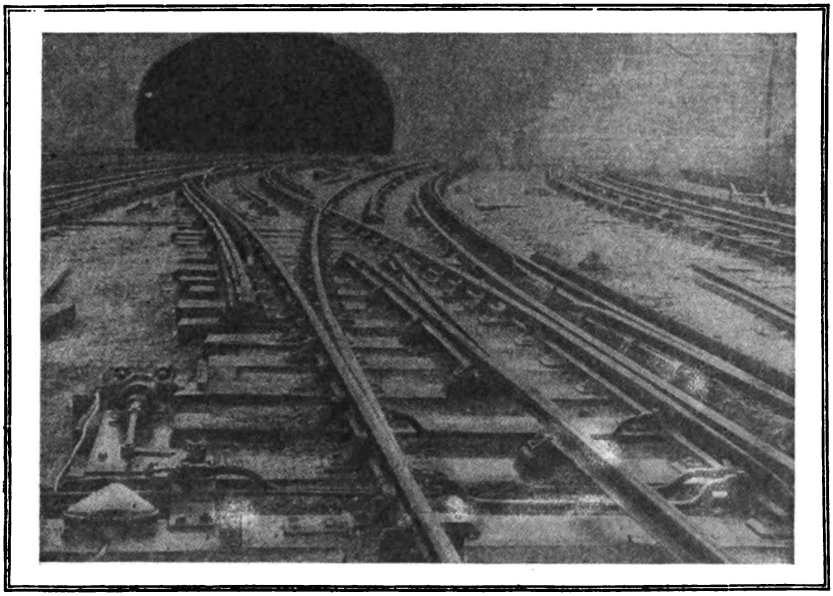

Fig. 3. Track, third rail, and trailing switch layout, District Railway, London

3. The use of Mansell wheels. These wheels have wooden centers, and in order to form a shunt upon the track circuit the wheel tires must be specially bonded to the axles.

4. The use of cast-iron wheels with steel tires, making poor electrical contact between the tire and the wheel center.

When the North Eastern Railway installed its automatic block system it was found that the contact between the wheel and the tire was often insufficient to secure a proper shunt, and the railway company found it necessary to bond the tires of all goods-wagon wheels to the wheel centers to secure proper electrical contact.

5. The inward canting of rails to correspond with the coning of the wheel treads.

Almost all British rail is supported in cast-iron chairs which are given such a slope as to cant the head of the rail inward at an angle to correspond with the coning of the wheel treads, which is generally one in twenty, though some roads use one in ten. This, of course, causes a larger bearing area between wheel and rail with proportionately less concentration of load, thus diminishing the probability of good electrical contact.

6. Whether from the chemical composition of English rail or from some other properties of it or from atmospheric or other conditions the rail heads in use appear to acquire a sort of film or glaze, which is a poor conductor. While the cause of this condition is not definitely known, its existence is vouched for by British signal officers of repute.

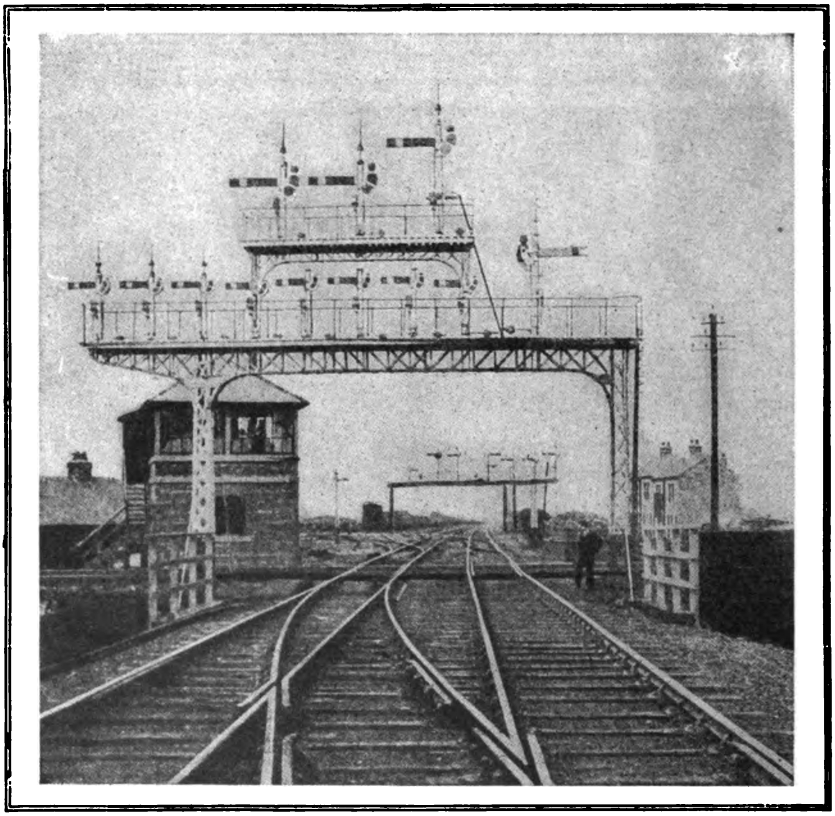

Fig. 4. Signal bridge, Tyne Dock, North Eastern Railway, England

On the underground electric railways in London, including the Baker street and Waterloo, the Great Northern, Piccadilly, and Brompton, the Hampstead Tube, and the District Railway, there are over 500 automatic block signals in use, mechanical-trip automatic train stops being used in these installations. All of these roads use direct-current propulsion, and the track circuit used for signaling is of the polarized, direct-current type, a factor in the use of such track circuits in connection with a direct-current propulsion system being the use of the fourth rail in the track for the propulsion-return circuit, the two running rails not being used for this purpose and the third rail being used for the propulsion feeder. This arrangement is installed on account of the British Board of Trade regulation which requires that when the running rails of an electric railway are used for propulsion return the drop must be restricted to ten volts, the requirement being made in order to prevent electrolysis of water pipes and other metal conduits or structures laid underground. The electric railways in London find it cheaper to install a separate insulated return rail than to restrict the drop in the return circuit in compliance with the Board of Trade regulation.

On the Liverpool and Southport electric line of the Lancashire and Yorkshire Railway a number of semi-automatic high semaphore signals are used, operated by solenoids, using the 600-volt current from the third rail. While they are in daily service and working reasonably well, the railroad officers do not consider them a particularly desirable form of electric signal. These signals are controlled by track instruments called treadle bars, which are mounted inside the running rails in such a position as to be depressed by the wheel flanges, this movement being used for the operation of circuit controllers.

The treadle bar and other forms of track instruments are used to a considerable extent in Great Britain and on the Continent in connection with controlled manual block systems and for the control of indicators and annunciators at interlocking plants, and in fact for a great many purposes where in America a track circuit would be used. There is, of course, scarcely any comparison between what can be accomplished by treadle bars as compared with track circuits, either from the standpoint of reliability or economy, under American conditions, and while, for the reasons previously stated, the use of the track circuit has met with but little favor in Great Britain, its use is increasing, and it is believed by those familiar with British signaling conditions that this increase will be considerable in the next few years.

B. INTERLOCKING.

The protection of switches on most European railways is much more complete than in America, as practically all main-track switches are interlocked with fixed signals. By far the greater proportion of the interlocking is mechanical, though both in Great Britain and on the Continent power interlocking has come prominently to the front in the last few years, not, by any means, however, to so great an extent as it has in America. In Europe there is a marked tendency to use mechanical interlocked machines at much larger plants than would be mechanically interlocked on American roads. The mechanical interlocking used in the United States is of British origin, but appears to have developed faster in improvement of details than has the English practice.

Notable features of British mechanical interlocking machines are the small amount or preliminary latch locking used and the heavy and substantial construction of the locking bars and tappets. Some British signal engineers claim that there is no advantage in preliminary latch locking, but to the American observer it would appear that the reason it is not used is principally because many of the machines are so large and the locking bars so long and so heavy that it would be exceedingly difficult for a signalman to operate a lever latch which was provided with a latch spring sufficiently powerful to drive the locking bars.

As previously noted, almost all distant signals are operated with a single connection, a small galvanized stranded cable being used. As noted in the portion of this report dealing with the manual block system in Great Britain, the night indication of the distant signal in the caution position is identical with the night indication of the home signal in the stop position, namely, a single red light. In a number of other respects the indications differ from those used in America, particularly as regards the indications for route signaling. The practice in this respect in Great Britain and to a considerable extent on the Continent is to display each signal arm denoting a diverging route upon a separate mast or post rather than to display the arms one above the other on the same post. For example, a single diverging route is indicated usually in America by a two-arm post, the upper arm governing the main route and the lower arm the diverging route, whereas the European practice is to use a bracket post with a single arm displayed on each mast or doll, these being arranged upon the main bracket post in the same relation as are the tracks that they govern. The Belgian State Railways formerly used the American method for indicating diverging routes, but have recently changed from the one-pole, two-arm type to the English practice, using a separate post or doll for each track, mounted upon a bracket mast or, as the French and Belgians call it, a "chandelier" or candlestick.

"Calling-on" arms are frequently employed to permit switching movements to be made past a signal at the entrance of a section of track which is not clear.

On the Belgian State Railways the proceed indication is given by the upward inclination of the semaphore arm. On the Northern Railway of France distant block signals are in the form of a circular disk; home block signals are semaphores of the skeleton type with enlarged rounded ends; distant signals for interlocking plants are square or lozenge-shaped metal banners, the former being used when the signal is located 800 meters or more from the home signal, and the latter form when on account of view or other conditions it is necessary to locate the distant signal at a less distance from the home, and the home interlocking signals are in the form of a square. Disk and square banners have the disadvantage that in the proceed position they are turned edgeways to an approaching train, the proceed indication being given simply by the absence of the caution or stop indication. On this railway diverging routes are signaled by pointed or fishtail arms in addition to the square banner home signal.

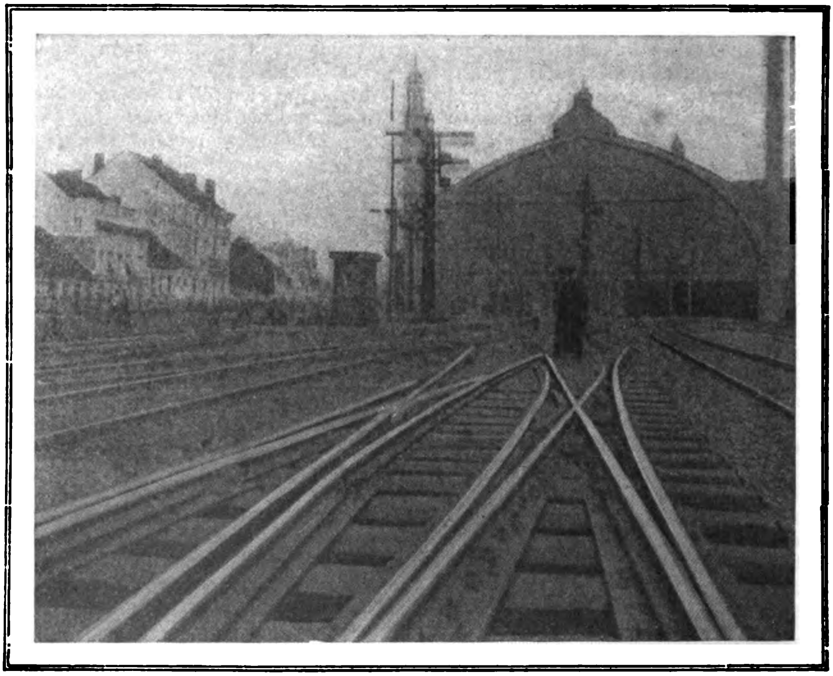

Fig. 5. Tracks and signals, Gare Centrale, Antwerp, Belgium

Lattice cantilever brackets are frequently used to support home signals in such a manner as to bring them over the tracks to which they refer. Very large wire compensators, mounted in heavy cast-iron frames, are placed at the middle point of most distant signal wire lines, the distant signal being operated by a single stranded cable. These compensators are used for distances as great as two miles.

Both inside and outside detector bars are in use. Some roads are using solid rods for cross-leads instead of pipe, and a few roads use channel-iron sections for switch lock and signal connections instead of pipe. At least one road in Great Britain uses separate facing point locks for each point of a pair of switch points.

In power interlocking little advance is being made in Great Britain along electrical lines, with the exception of a few isolated examples of electric systems. The only type in extensive use is the Crewe system on the London and North Western. This system of power electric interlocking was designed by officers of the road, and the apparatus is all manufactured, as is all signaling and interlocking apparatus used on this road, in its own shops. The system is relatively simple and rugged in construction, though each individual lever, with its contacts, connections, and indication magnet and fittings, occupies much more space, particularly in a vertical direction, than is the case in American machines.

Current is supplied at about 230 volts potential. The switch motors take about two amperes in starting light and about ten when carrying the full load of the switch points. The signals, which are of the solenoid type, require about three amperes for clearing and hold clear on one-half ampere. At Crewe Station, which is an important and complicated junction, single-arm semaphore signals are used for the diverging routes, provided with a route indicator in the shape of a stationary rectangular board constructed on the principle of slatted signs to display a very large letter to indicate the route, such as M for Manchester, H, Holyhead, etc.

The tappet locking of these machines is arranged in two and even three banks, the tappets being crank driven from vertical rods operated from miniature levers of the mechanical interlocking machine type arranged one above the other. These rods also operate heavy carbon contact blocks for the control of the circuits operating the various functions, and are in turn controlled by indication latches of the hook form having horizontal magnets. All parts of the switch machines except the motors run in oil. Battery indication is used and there are no considerable refinements of circuits or protective devices for cross and ground protection, at least not to anything like the same extent as in America.

A considerable number of low-pressure

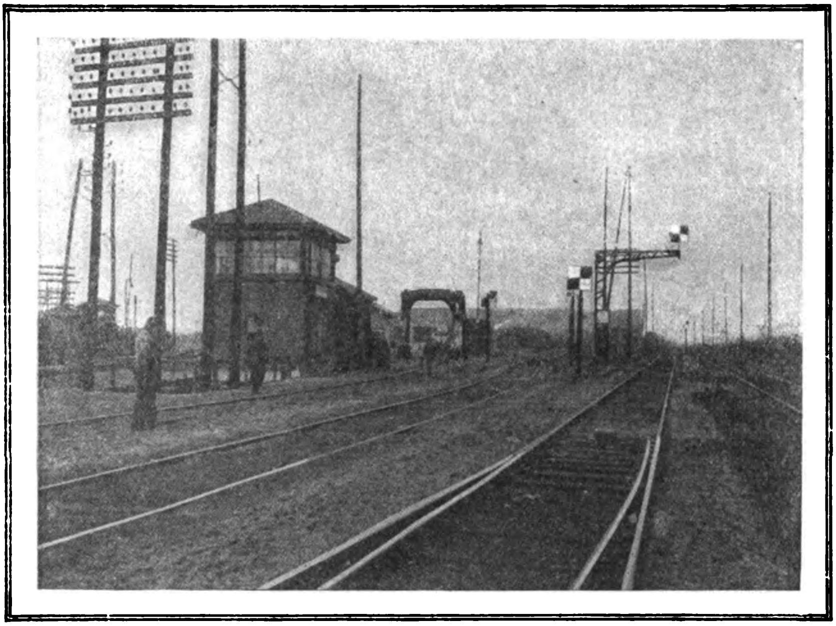

Fig. 6. Cabin No. 11, La Plaine, Chemin de Fer du Nord, France, showing a ground post and a bracket cantilever home signal

pneumatic interlocking machines have been installed in Great Britain and a number on the Continent, and in some of the installations, notably on the Northern Railway of France, route levers rather than function levers have been used; that is, instead of having a lever for each switch or crossover, and a lever for each signal, one lever is provided for each route through the plant, the apparatus being so arranged that when the lever for a given route is reversed the various switches in that route will be successively set, locked, and indicated, the proper signal clearing upon the return of the last indication, denoting the complete setting up and locking of the route.

Two notable installations of power interlocking in Great Britain are the electro-pneumatic plants recently installed at Newcastle-on-Tyne for the North Eastern Railway, the south box of this station containing 211 levers, and the new plant at the Glasgow Central Station on the Caledonian Railway, which, so far as known, is the largest power interlocking machine in the world. It contains 374 spaces.

At the Newcastle plant selection is freely used, as on machines of this type in the United States. There appears to be a considerable difference of opinion among British signal officers as to the use of this expedient. In the Newcastle installation the track circuit is used extensively for operating an illuminated track diagram or indicator to denote the presence of trains on the various track sections, though it is to be noted that these track circuits control visual indications only and are not used for the control of electric locks on the interlocking machine levers.

A new electric interlocking system is

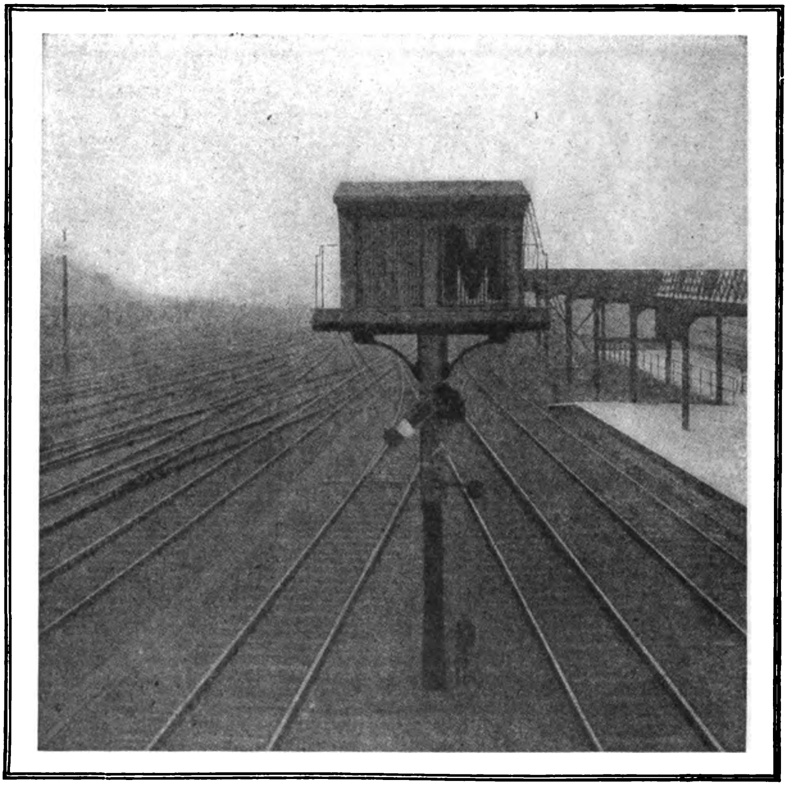

Fig. 7. One arm route signal and indicator, Crewe, London and North Western Railway

being developed by Mr. Arthur H. Johnson, signal and telegraph superintendent of the London and South Western, in which an electric motor drives a rotary paddle in oil to force the oil into a cylinder, the piston of which operates a lock and switch movement. The return indication in this system is of the alternating current type, in which a small A. C. motor is provided for each lever. This drives a ball governor of ingenious design for tripping the indication latch.

The switches and signals of the large interlocking at the Antwerp Station of the Belgian State Railways are controlled by a Siemens & Halske electric interlocking plant, a considerable number of which are in use on the Continent. At the time of the committee's visit, however, this plant was undergoing extensive alterations on account of track changes, so that little opportunity was provided to study its working.

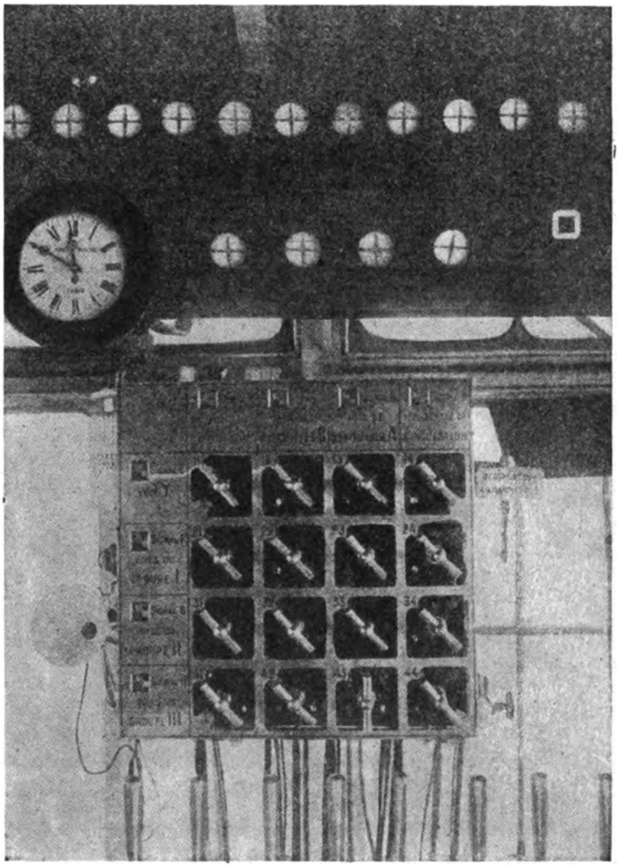

Fig. 8. Route lever interlocking machine, "autocombinateur," Cabin No. 11, La Plaine, Chemin de Fer du Nord, France

At Cabin No. 11, of the Chemin de Fer du Nord, in Paris, is a hydraulic interlocking plant, constructed entirely upon the route-lever principle and known as the Autocombiner. This machine is constructed on the following principles: If there are two main tracks, A and B, which serve four yard tracks, 1, 2, 3, and 4, the machine would contain two rows of four levers each, and if, for example, it were desired to set the switches and signals to move a train from main track A to yard track 3, the lever in horizontal row A and vertical column 3 would be operated. In the same manner, if it were desired to move a train from yard track 4 to main track B, the lever at the intersection of column 4 and row B would be operated. The indication locking of this machine is hydraulic and of the successive or series type.

Electric indicators and repeaters are extensively used at British interlocking plants and are of substantial construction, though the development of relays and other electric accessories has not advanced to the extent found in American practice. Chiefly on account of the relatively small number of such devices used, very little attention is paid to high insulation or to protection against lightning, which does not appear to be a particularly troublesome factor in signaling on British lines.

A novel piece of apparatus is an electric signal repeater, chiefly used for fog-signaling purposes, designed by Mr. Arthur H. Johnson, of the London and South Western. The magnets, and in fact all working parts of this repeater, are mounted in a glass bath which is filled with refined petroleum, affording additional insulation protection as well as preventing rust. The glass being of good quality and the miniature semaphore arm of the repeater being placed quite close to the glass, the visibility of the indication is not at all impaired by the immersion in oil. This repeater is used at Waterloo Station, London, one mounted in a wooden box at each fogman's station. The cover of the box operates a switch so that current from the battery is not thrown on to the apparatus until the cover of the box is opened.

An examination of various forms of signal lamps and signal glass encourages the belief that such devices are much more highly developed in the United States than in Europe.

C. Roadway, Track, and Structures.

The roadway, track and structures of the British, French, and Belgian roads are of the most substantial character, no expense being spared to secure easy grade and alignment of roadbed. Stone ballast is the rule in Great Britain and on all the better roads on the Continent, and bridges and buildings are constructed in the most permanent manner.

A number of forms of track structure have been used in Great Britain in the past, but the tendency has been toward the development of a type of track now practically uniform throughout the country. Just as American track construction has tended toward the T-rail and driven-spike construction, with staggered joints, so has the English practice gravitated toward the bullhead type of rail secured in cast-iron chairs by wooden wedges driven on the outside, the joints, which are of the suspended type, being laid square. Much less uniformity is manifested on the continental roads where the types of track construction are numerous and varying from the British practice to the American. While several methods of securing the cast-iron chairs to the ties are used in England, the preferred method seems to be to bolt the chair to the tie by two bolts with the nuts on top. Many roads still use lag screws, round spikes, and wooden treenails for this purpose.

The only advantage of the bullhead type of rail appears to be in the symmetry of its cross-section, which tends to equalize the initial stress incident to manufacture. This type was originally designed with the idea of reversing the rail in the chair when the top surface had become worn, but this is not done to any extent at the present time, as it is found that the bottom head wears at its bearing surfaces on the chairs sufficiently to produce an undesirable roughness if the rail is turned.

Ties in Great Britain are generally five inches thick, creosoted, and sometimes are made of jarrow or other tropical hard woods.

On the Belgian State railways the standard angle bar is a 6-bolt suspended joint, four lag screws being used to fasten the bars to the ties. The Northern Railway of France uses a 4-bolt suspended joint with the nuts on the inside of the rail, the ballast on the outside being graded nearly up to the top of the rail.

A number of roads formerly drove the wooden keys or wedges on the inside of the rail, but this has been almost universally abandoned in favor of driving the wedges on the outside, as by having the wooden key or wedge between the rail and the chair less shock is brought upon the latter, thus reducing very considerably the number of chair breakages.

Tie plates are used to some extent in France. The London and North Western Railway uses a felt pad under each chair, and a 4-bolt suspended joint, the chair being secured to the sleeper by two lag screws with wooden ferrules and two round spikes without ferrules. The track of this railroad as a whole was the finest that we saw, though the Great Western and portions of the London and South Western compared most favorably in appearance and in riding qualities with it and with the best American tracks.

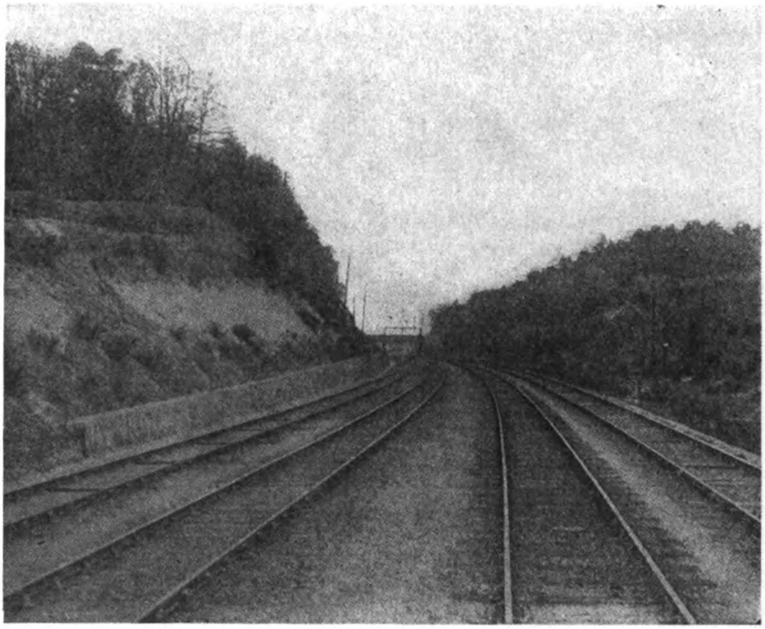

Fig. 9. A portion of four-track line, London and South Western Railway

An interesting feature of English track layouts is the large number of rigid frogs employed, easy curvature frequently being obtained by the use of separate and direct connections between tracks separated by intervening tracks, rather than by the use of simple crossovers, as is the general practice in America. Switch-stand construction is not highly developed for the reason that all main track switches are interlocked.

Switches are all of the point type, and the general practice is to cut out the stock rails about three-sixteenths of an inch to permit the use of a reasonably thick switch point and still preserve smooth riding qualities. On the Belgian State railways a number of cast-steel switch points were observed, and it was noted that both driven and screw track spikes were used.

Owing to the absence of pilots on locomotives, guard rails projecting as high as two inches above the running rails are often used, particularly with crossing frogs, on the French and Belgian roads. For the protection of employes required to be upon the track the Northern Railway of France paints its switch fittings, the ends of guard rails, and other obstructions which might trip a man walking on the track, with whitewash, frequently renewed, to enable them to be readily located at night.

A noticeable feature upon the French railways was the use of translucent ground-glass signs, one being placed about 1,200 meters in the rear of the distant signal at every point where a route diverges, bearing the word "Bifur," an abbreviation of bifurcation. The signs of this type are also used to indicate the ends of all stub tracks, displaying in large characters the words "Voie d'impasse," bumping posts also being indicated by the same type of sign with the words "Heurtoir d'impasse." These same ground-glass signs with black numerals are used to indicate the permissible speed in kilometers per hour wherever slow signals are required, a plain white board with a white light being used to denote that full speed may be resumed. These translucent signs are illuminated at night.

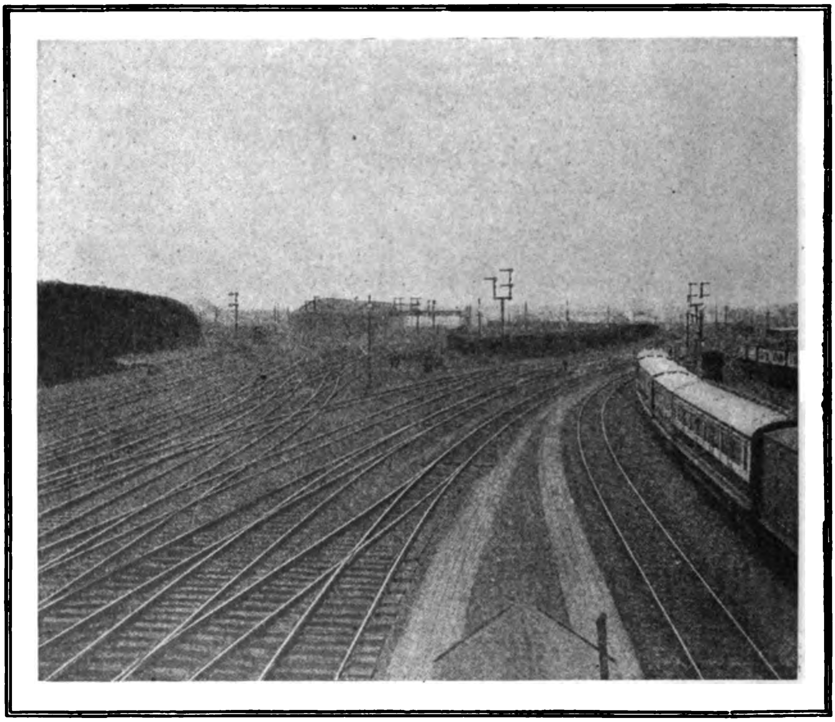

Fig. 10. Junction at South Box, Crewe, London and South Western Railway

The Northern Railway of France, like the roads of England, runs left-handed.

Most standpipes used for supplying the water to locomotives do not use an arm extending over the track, but are provided with large-sized leather or canvas hose to reach from the standpipe to the tender, a method involving less danger than our swinging water cranes, though it would doubtless be much more difficult to keep in proper condition during the very cold weather experienced in this country. It was noted that in England iron baskets mounted on tripods and carrying live coals were provided at water columns, these evidently furnishing sufficient heat to prevent the flexible hose from becoming clogged with ice. The London and North Western uses track tanks, the water scoops of the locomotives commonly being operated mechanically rather than by compressed air.

D. DRAWBRIDGE PROTECTION.

The only drawbridges inspected were those at Naburn and Selby on the North Eastern Railway. At both of these points plate girder swing spans carry the two main tracks of this railway over streams having a considerable water traffic. The spans are mounted on tubular piers and turned by rack and pinion gearing, driven by three-cylinder hydraulic engines of the oscillating cylinder type, the pressure being derived from steam-driven compressors located on the shore and transmitted through pipes having valves and couplings at the shore end of the span, and required to be disconnected for turning the bridge. A sufficient accumulation of pressure for two or three turnings is stored in accumulators under each draw span. The turning, end raising, and wedge withdrawing mechanisms are mechanically interlocked with each other, and with a lever electrically locked from the signal cabins on each side of the bridge. Mechanical bridge couplers for the interlocking pipe connections, as well as electric bridge couplers for the line circuits, are provided and interlocked with the wedges, or rather "resting blocks" (which are not wedge-shaped, but parallel faced), to prevent the coupling up of the pipe or wire connections until these "resting blocks" are in place. The same practice in the operation of the block system is followed at these drawbridges as at junction points, namely, blocking back, i. e., not permitting trains to pass the second cabin in the rear of the bridge when the draw is open. Probably no one requirement of the Board of Trade has done so much to prevent accidents at junctions and drawbridges as this one, which establishes what may be called an overlap at such points. With the exception that no track circuit is provided nor any means of carrying the wheel load from the bridge rails to the short rails, either in the form of miter-rails or sliding joint bars, the protection is quite complete. All of the foregoing applies strictly to Selby.

At Naburn mercury contact treadles were being put in at the approaches and Sykes detector bars at the home signals to afford somewhat the same measure of protection as would be afforded by track circuit. At Naburn, also, a device is installed whereby in case of failure of the electrical apparatus of the block system a key could be carried from one cabin to the other for releasing the apparatus so as to permit working to continue until repairs are made. In the electrical protection being installed at Naburn, and at some other places, the use was noted of relays in which permanent magnets are used, normally tending to pull the relay contacts open, while electro-magnets are used to offset the pull in the permanent ones, closing the contacts. It is

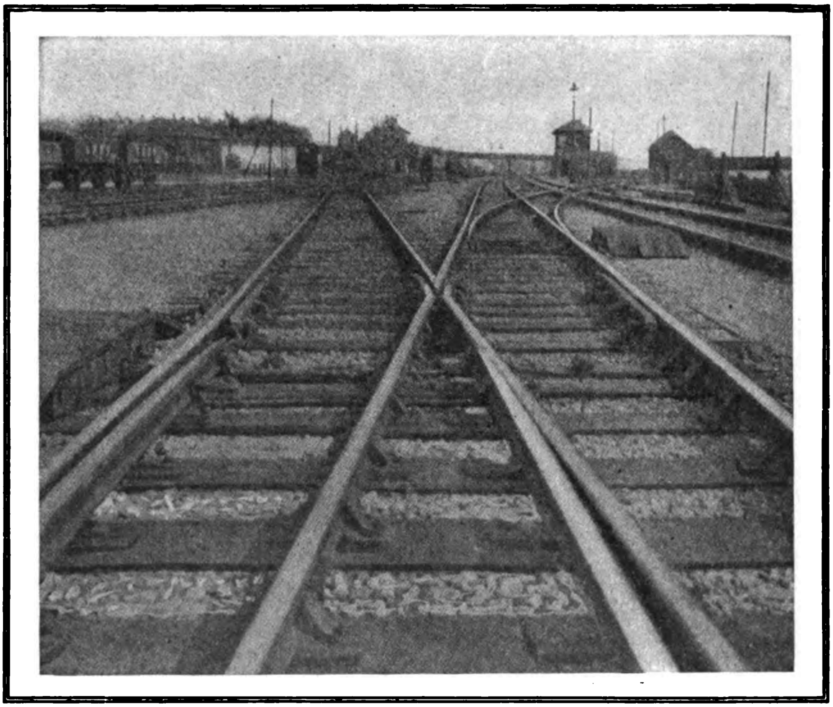

Fig. 11. Portion of track layout at Basingstoke, London and South Western Railway

claimed that these relays are more efficient than the ordinary neutral type, and that the pick up and release points are brought considerably closer together. A feature of interest in the construction of the drawbridges at Naburn and Selby was the fact that the floors had no ties, the rails being carried on longitudinal stringers which rest on the floor beams, the only other flooring being one of transverse strips of plate about one-half inch thick, six inches wide, no provision being made for carrying any derailed wheels over the bridge. The construction appeared to be such that a derailed vehicle would be likely to damage the bridge.

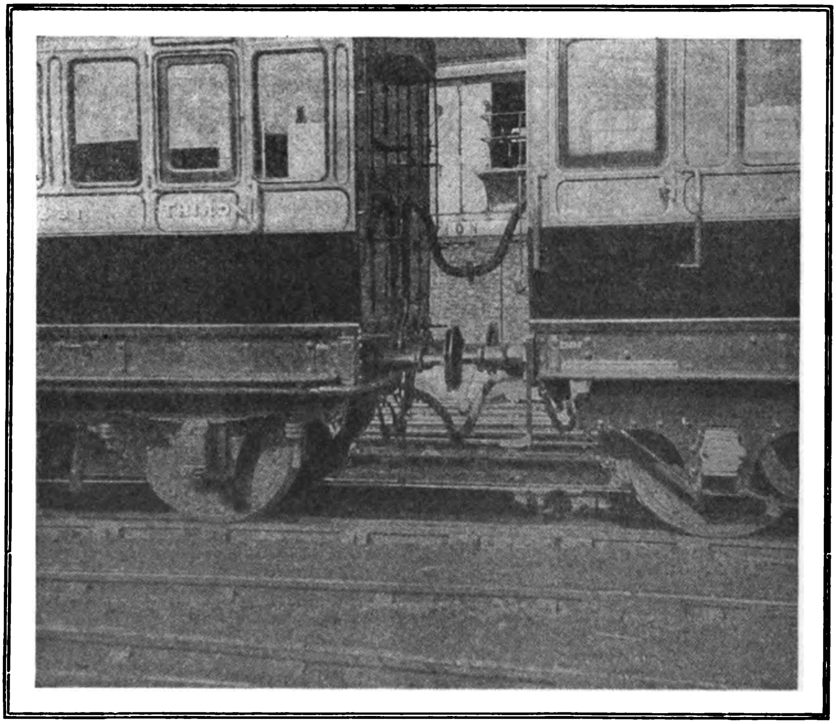

Fig. 12. Buffers and hose connections, British passenger carriages

E. EQUIPMENT.

The weights of European locomotives, passenger and freight cars have increased somewhat during the last few years, though to a much less extent than in America. The standard of maintenance on most roads is high, considerable attention being paid to smartness of appearance. The increase in weight of locomotives has increased the length, and the later large locomotives are generally provided with a forward truck or bogy. The use of passenger coaches of the corridor type has materially increased some of the comforts of traveling. There are practically no box cars on British railroads and comparatively few on the Continent, practically all freight being carried in short, open cars of the gondola type, goods that would be damaged by wet weather being covered by tarpaulins. While a considerable number of 40-ton cars have been built for the export coal trade and a considerable number of 20-ton cars are in use, the larger part of merchandise freight continues to be handled in cars of from seven to twelve tons capacity. British commercial methods, under which retailers, as a rule, carry very small stocks, which they replenish with great frequency, continue to provide a great field of usefulness for the small car. By far the greater percentage of freight cars, or goods wagons, as they are called, are of the 4-wheel type, using a link and hook coupler and side sill buffers, a lever brake to be operated by hand or foot or the weight of the body, the brake lever being placed on one side of the wagon only. Continuous brakes are rarely found on goods equipment, and automatic couplers on neither passenger nor goods cars.

In making up trains or in switching work trainmen are supposed to use a wooden stick with a steel hook on the end for making couplings and picking up the end link of the three links of chain attached to the coupling of one car and engaging one of the three links with the coupling hook on the adjacent car. Couplings are frequently made without the use of a stick. It is not necessary to make the coupling until the cars have come to a stop. The usual form of coupling on passenger coaches consists of a wrought-iron or steel draw-bar with a hook end, the hooks of two adjacent cars being connected by a steel turn-buckle, the right and left handed screw of the turn-buckle having a lever pivoted to its center portion, the end of this lever being enlarged into a ball of metal three or four inches in diameter, so that once the turnbuckle is sufficiently tightened the weight of the ball on the end of the lever will prevent the turn-buckle from unscrewing. The use of these turn-buckle couplers together with the side sill buffers adds considerably to the solidity and riding qualities of the train, though the type of construction is not well adapted to very sharp curvature. A considerable agitation is now taking place, particularly by railroad employes, in favor of what is termed the "either side brake," it being considered by the advocates of this arrangement that it is very desirable to have a brake lever on both sides of every goods wagon, so that in switching operations these wagons may be braked without the necessity of brakemen having to cross the track or go between moving vehicles to get to that side of the wagon which is provided with a brake lever. Of the continuous brakes in use the larger percentage are of the vacuum type, though the Westinghouse air brake is used to a consiledable extent in Great Britain and on the Continent. All British railroads and the Northern Railway of France as well as some other continental roads run left-handed and the engineman drives on the left-hand side of the cab, a noticeable feature of the engine control being that most throttle valves are operated by a screw rather than by a push-and-pull lever, and the same is true to even a greater extent of locomotive reversing gear. The use of the bell is unknown on British locomotives, the whistle alone being used for giving warning signals.

F. FOG SIGNALING.

The impetus that has been given to the design of cab signals in Great Britain on account of the prevalence of fog in that country has been mentioned in this report and attention called to the fact that such fogs are at times so severe as to entirely prostrate the freight traffic of a large railway for several days. The method of fog signaling used in Great Britain is to supplement to as great an extent as possible all visual signal indications by audible ones. It is hardly possible for one who has not seen British fogs to realize the density or the effect upon traffic of the continuance for several days or a week of fogs so dense that pedestrians frequently become lost in a familiar locality. Of necessity British railroad companies must have a very complete organization for handling traffic in times of snow and fog. The fog signalmen or fogmen, as they are called, are generally detailed from the track forces. Lists of the names and addresses of these men and their fog stations are posted in the signal cabins and careful arrangements made for promptly notifying them when their services are needed, both day and night, and for relieving them or subsisting them while on duty. Fog signalmen are provided with hand lamps and with a supply of detonators or torpedoes for use as audible signals. On most roads a small shanty containing either a fireplace or provided with a strap iron basket for a coal fire is located at or near each distant signal and is used as a fogman's station. The duty of the fogman at each distant signal is to place an explosive cap or detonator upon the rail whenever the distant signal is at caution and to remove it from the rails whenever the distant signal is cleared. Fogmen detailed at the block stations operate detonators in connection with home and starting signals and assist the signalmen in giving information or instructions to trains.

In many cases where one fogman has to serve more than one distant signal and for that purpose would be required to cross running tracks, and hence be likely to be struck by trains, mechanical torpedo placers are used, consisting of a single or multiple torpedo holder and connections for operating it from a small lever stand near the track, enabling the fog signalman to place from one to four torpedoes successively upon the rails of one or more tracks by operating the levers mounted in the lever stand. In some localities miniature signal masts and arms, copies of the actual signals used for controlling train movements, are mounted near the base of the full-sized signals, the arms on the models being connected by wires with those of the actual signals, thus serving as repeaters. The fog at times is so dense that the position of the working arms can not be seen, and it is necessary for the fogman to be guided by the operation of the model in placing his torpedoes upon the rail. A single-shot torpedo placer operated by the signal itself was observed on the Belgian State Railways. On the Northern Railway of France a number of torpedo placers were seen, one in particular, which was used in connection with the home signal of an interlocking plant, being so designed as to be operative only for movement with the current of traffic, a treadle being provided which upon being struck by the wheel of a car or engine making a reverse movement would remove the torpedo from the rail, so that it would not be exploded by a vehicle in moving in the reverse direction. Various magazine torpedo machines have been developed in Great Britain, probably the one most used being the Clayton fogging machine. This consists of a portable cast-iron box or magazine containing a number of detonators designed to be kept in the signal cabins and taken out by the fog men to their various stations when they report for duty. It is mounted upon the fixed portion of each device, which is located close to the rail and worked through pipe connections from a lever stand. In one of the cuts showing a typical signal bridge carrying low-pres-

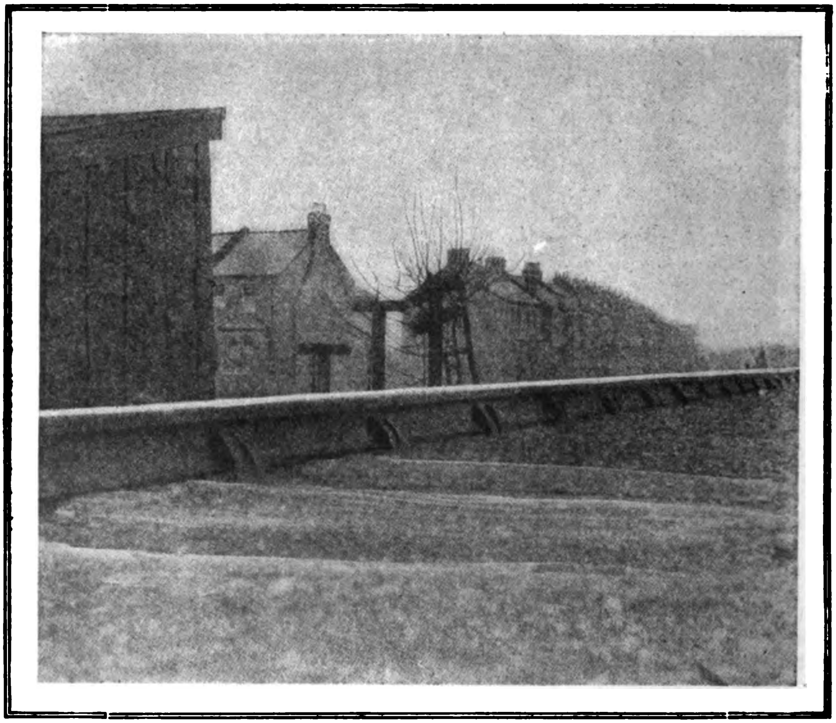

Fig. 13. Miniature mechanical repeater for bracket post signal used as a guide to fogman in placing torpedoes when fog is so dense that he can not see the signal itself. Fogman's shanty at left

sure pneumatic automatic block signals on the London and South Western Railway an installation of this machine is shown, together with the connections and the cabins from which the machines are operated by the fog men. The North Eastern Railway of England abandons its automatic block during fog and falls back upon its manual block, the operating officers appearing to believe that they can better do without the track-circuit protection in such cases than without the verbal information given by the signalmen for each train movement.

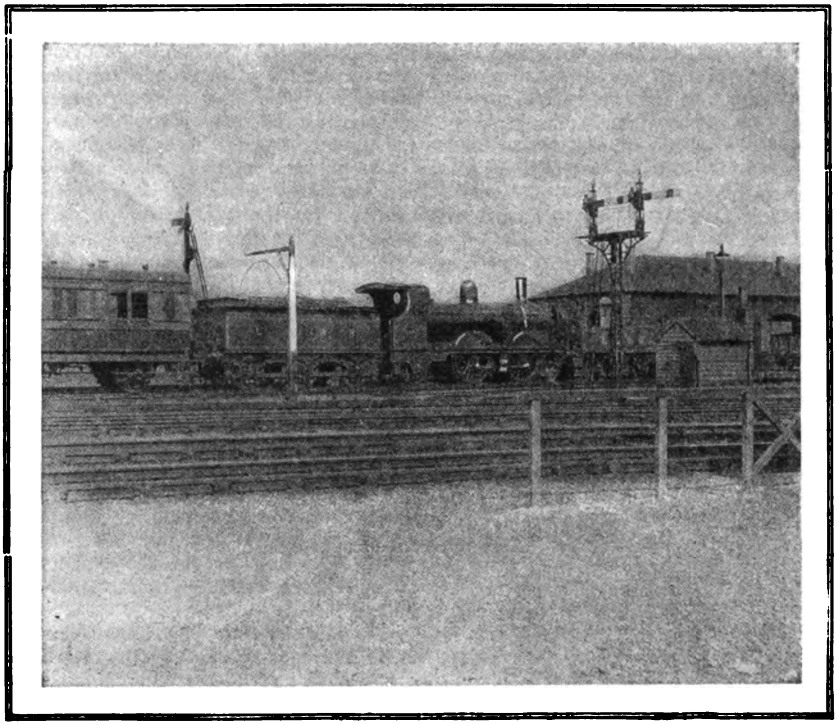

Fig. 14. Signals, locomotive, and loading gauge, London and South Western Railway

G. MISCELLANEOUS METHODS AND APPLIANCES FOR PROMOTION OF SAFETY ON BRITISH RAILWAYS.

Transportation of Explosives.—Under the British Board of Trade regulations the transportation of explosives is optional with railway companies, and a railroad may decline to accept any for shipment. Most of them, however, transport explosives under regulations which, though strict, are not uniform for all roads. Any railroad company may notify prospective shippers that it is not a carrier of explosives and will only transport them as dangerous goods under rigid exactions and entirely at the responsibility of the consignor.

Train Movement Against the Current of Traffic.—There being no officer corresponding to the American train dispatcher upon British railways, movements against the current of traffic are not handled from headquarters or a remote point by telegraphic orders, but entirely by an official, usually a station master on the ground, every train being conducted over the portion of the track temporarily being worked as a single line by a pilot under very complete rules. The use of one track of a double-track line is undertaken only in the event of a wreck or obstruction on the other main tracks.

Loading Gauges.—On account of the nonuse of box cars or other cars with roofs or covering of fixed type it is necessary to provide means for checking the loading of goods wagons so that the load will not be piled so high as to interfere with overhead structures. For this purpose loading gauges are established at the outlets of all freight yards, each consisting of a post with a projecting arm, from which is suspended a curved bar of metal conforming in shape and in location to the top of the load clearance diagram, and all cars must be so loaded as to clear this gauge.

Protection of Stations and Right of Way.—Passenger station platforms are built high enough to be nearly on a level with the floors of passenger cars, all passenger equipment being provided with side doors and a running-board providing an easy step from the platform to the vehicle. Railway rights of way are substantially protected by fences, walls, or hedges, and the very few highway grade crossings that exist are protected by crossing gates that are heavy enough and tight enough to constitute a real protection rather than a simple warning, which is about all that the usual American highway-crossing gate can be said to provide. Accidents to trespassers upon railroad property are rare, not only for the reason that the rights of way and stations are thoroughly fenced, but because the law providing penalties for trespassing is rigidly enforced.

Signal and Train-Movement Recorder.—At Lostock Junction on the Lancashire and Yorkshire Railway the committee saw an experimental installation of the Hughes signal recorder. This is a device for simultaneously recording the time and character of any signal transmitted or displayed. The device is intended primarily for use with a manual block system and provides paper ribbons driven by clockwork upon which are recorded, by means of magnetically controlled type wheels, numbers indicating the character of a telegraph code signal, simultaneously recording the time at which the signal was transmitted. In working the British manual block system various calls are given and received by bell code or by the needle telegraph, such as "Attention," "Acknowledgment," "Is line clear?" "Train in section," etc., the various signals being indicated by the number and duration of the electrical impulses. In the recording device described these impulses are used to actuate the mechanism for recording them and also the time at which they take place. The characters printed by this machine upon the traveling paper ribbon constitute a complete typewritten record of the working of the block system at any point where the apparatus is installed. The mechanism is well designed and constructed, but costly.

(To be Continued.)

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*In What Manner Can the Road Foreman of Engines Best Assist in Increasing the Net Earnings?**

Railroads are dependent upon their entire organization for their revenue. The net revenue is dependent upon the combined ability of all the employes from the president to the one occupying the position relative to the least significance.

A railroad company may very justly be compared with any large manufacturer. In the mammoth organization known as the United States Steel Corporation its business is composed of two sides or units: the producing side that furnishes the manufactured product; and the sales side, the business of which is to market the finished article. The success of all manufacturing plants is dependent upon two conditions:

First, the manufacturing side must produce articles that are the equal in every respect of like articles produced by other manufacturers engaged in the same lines of business and be able to produce them at a first cost that is competitive in the open market with articles of like nature produced by the other manufacturers.

Second, the sales department must possess the capacity and ability to market the finished product at such prices above the cost of production as will leave a legitimate margin for the manufacturer. The result of the combination of the two elements as above outlined will determine whether the manufacturer continues in business or whether his business is turned over to the courts and passes into the hands of other people.

This is exactly where we stand in the railroad service, and the road foreman of engines occupies in reality an important position in the railroad organization, for there is probably no one element which enters more largely into the railroad's cost of producing what it has to sell, viz., the transportation of freight and passengers, than the movement of the trains; and the cost of moving passengers per mile or the thousand tons of freight per mile is affected largely by the manner in which the power is handled, and it is largely the duty of the road foreman of engines to get out of the power the possible one hundred per cent. of its revenue capacity. It is generally conceded that a freight locomotive should make an average of not less than 30,000 miles per year. We will assume that the average freight carload is twenty tons per car. Let us consider the net result to the railroad if through the careful guidance of the road foreman of engines one additional car can be added to the train. This would increase the tonnage revenue of the locomotive 600,000 tons one mile per year, and assuming the average returns to the railroad to be one-half of one cent per mile, we have increased the revenue of each locomotive $300.00 per year.

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* Report of committee, Sixteenth Annual Convention, The Traveling Engineers' Association, Detroit, Mich., August 25, 1908.

"Can't" is the unfortunate attitude of thought held by a large number of men, and all of us have met in our experience this ready "can't" each time we have presented to others some such possibility as above stated. In writing the preceding sentence I have not overlooked the fact that on some lines the tonnage question has been carried to an extreme, and that the power has been so completely overloaded that in the effort to move tonnage the reverse condition has resulted, and unfortunately on those lines two extremists have met with disastrous results to the net earnings of the railroads. One side has insisted upon the enforcement of the exaggerated idea of tonnage per train, with the result that trains actually spend more time on sidings than is required to cover the distance between terminals, and at the same time those trains consumed more time waiting for orders than the actual running time required between the terminals. In other words, more time is lost on sidings and waiting for orders twice over than is required to cover the distance between terminals, and I question the economy of such operations. But I do not justify the attitude of the other extremist who always insists upon "can't" and therefore does everything in his power to defeat the other plan by increasing the delays above stated.

In all of my railroad service, I have insisted that there is only one department on a railroad, and that is the Department of Profit and Loss, and it is therefore the sole duty of each and every officer of the railroad to let the idea of increased net profits be the mainspring of each and every act as relates to the railroad operation. Therefore there should be no opposing influence between those connected with the motive power and those who are giving their undivided time and attention to the matter of transportation. There should be no conflict between those at the head of the motive power and those at the head of transportation. There should be a close co-operation between the road foremen of engines, train masters and train despatchers, and each should be perfectly willing at any and all times to set aside his personal opinions in deference to those of the other in an earnest effort to bring out the highest possible good for the railroad as a whole. This statement applies to each and every person in the employ of the railroad from the highest to the lowest, and working along these lines I do not hesitate to say that there are thousands of locomotives in service today that will easily handle one more car per train than they are hauling now on an average year in and year out, and if properly kept moving will handle one more train each month instead of consuming this time on side tracks. Dispatch is just as valuable to the shipper as a lower freight rate, and he will always patronize the road that delivers the goods to him with the least delay.

The road foreman of engines and those whom he represents can do a great deal toward drawing the line of consistency between prudence on one hand and overloading the locomotive on the other, and in this way will be able to get the locomotives over the road with less delay and get them into terminals where they can receive proper attention in the way of necessary work and with very little delay have them ready for another successful trip, all of which proves economical in the cost of maintenance and fuel and will enable you to greatly increase the miles per locomotive in your charge.

This means more tons of freight over the road in a given time with the same number of locomotives, and less cost per ton mile. Nothing requires more careful thought and closer co-operation between the road foreman of engines and the transportation department than this one question. By taking hold of this problem with a determination to improve conditions, you can do a great deal toward solving the transportation problem and increasing the net earnings of the railroad. The road foreman of engines can do a great deal to reduce the cost of production or increase the net earnings by properly educating the men under him.

The factor of safety is of the first and greatest importance and requires constant vigilance on the part of all concerned to avoid accident to passengers and employes and damage to property; next in order of importance is economy in the use of fuel, oil and all supplies. This requires close co-operation between the road foreman of engines and the engineers and firemen and close attention to the making of steam and then avoiding its waste. The engine must be properly drafted, so it will steam well. Brick arches must be cleaned off and flues kept clean. Keep all leaks out of the fire-box and plug up every other leak around the engine. I might here add that many road foremen of engines would be surprised if they knew the actual loss by leakage on the locomotive; in other words, the surplus steam the locomotive has to make in order to have the amount necessary to do the work. The outside machinery will ordinarily be inspected. The valves, cylinder packing, front end, flues and fire-box do not always get tested or examined until trouble of a serious nature exists. An engine with badly worn machinery that has a good boiler and uses the steam without leaks will handle a train fairly well, although it may take a little more coal. Yet the coal is doing the business because it is getting the train over the road, while the same engine with the ordinary leaks would burn more coal and not come near doing the work. In other words, any engine with the boiler kept in good steaming condition and without steam leaks will after the first three months' service out of the shop begin to increase its superiority over its sister engine that is cared for as many locomotives are cared for today, and it will increase its superiority day by day as the time out of the shop grows longer until finally when they go to the shop the first one will still be able to do pretty fair work while the other will be, in common language, "ready for the scrap pile."

In the report of the Master Mechanics' Committee that tested slide and piston valves for leakage in 1904, the following conditions are shown:

The best piston valves tested leaked 268 pounds per hour and the worst, tested at a mileage of 36,000, leaked 2,880 pounds per hour.

The best slide valves tested at a mileage of 17,500 miles leaked 384 pounds per hour and the worst tested at a mileage of 39,000 miles leaked 2,610 pounds per hour.

Leakage in pounds of water per hour

	Least.	*Greatest.*	*Average 14 L. Tests.*
Piston valves tested, 14 locomotives....	268	2,880	1,208.99
			Average 11 L. Tests.
Slide valves tested, 11 locomotives....	384	2,610	1,224.54
			Average 25 L. Tests.
Average leakage on all valves tested....			1,215.83

Average loss in coal for each engine per day, month and year, in both freight and passenger service, averaged at ten hours per day, evaporation figured at seven pounds of water to one pound of coal.

One Day.	*One Month.*	*One Year.*
1,736.9 pounds.	26.05 tons.	312.14 tons.

Average loss in dollars and cents per engine per day, month and year, coal figured at $1.90 per ton:

One Day.	*One Month.*	*One Year.*
$1.64	$49.23	$590.77

The tests were made on two different railroads and with great care. The leakage was calculated by condensing the leakage steam and measuring it in pounds of water; the common snap-ring piston valve and the strip-partially-balanced slide valve were the ones tested. Multiply these figures by the number of engines in your service and the result gives food for reflection. Note the mileage at which this appalling waste occurs. Then, if you can, just imagine or estimate the amount of this waste during the time and at which time the engine reaches a satisfactory mileage or period of service; it will give you a fair estimate of the amount of steam and fuel wasted on account of steam leaks in valves and cylinder packing of the average locomotive.

The fireman also has a very important duty to perform in connection with economy in the use of fuel. The qualifications for a good fireman are: First, intelligence; second, physical strength and endurance. In the majority of cases no large amount of strength is necessary for proper firing, in itself, and we usually find the best firemen are not those who can raise the heaviest weight, but rather the man with moderate strength and great endurance. They are the men who fire properly and keep constantly at it. The strong man who depends on strength alone will handle more coal and work harder, will be exhausted and require longer periods of rest, all because he has performed much useless labor and incidentally thrown away a large amount of valuable coal. Comparisons between the fair-sized, wiry fireman who uses his head and the strong fellow who heaves coal can be seen at almost every division point in this country, and almost invariably results in favor of the former, provided he has been given proper instruction. As far as placing the coal on the fire is concerned, it consists chiefly in convincing the men, both by sound reasoning and actual example, that it will pay, and pay well, to scatter well-broken coal in small amounts on various parts of the fire at frequent intervals of time to avoid reducing the temperature of the fire-box below the igniting temperature of the gases, which would result in a waste of fuel on account of the gases passing away unburned in the form of smoke. This, of course, with the modern locomotive, means almost constant firing, but in most cases it is leisure work, and it is the way the locomotive must be fired to get the best results.

Right here let me digress from the topic to introduce a thought, which can be found in the "Ruling Passion" by Henry Van Dyke. In giving a description of two types of human nature, Van Dyke states that "he had natural force enough and to spare; whatever he did was done by sheer power of back and arm. He could send a canoe up against the heaviest water, provided he did not get mad and break his paddle, which he often did. He had more muscle than he knew how to use." In the other character, Van Dyke states: "This one did not have as much muscle as the other, but he knew better how to use it. He never broke his paddle unless it happened to be a bad one, and then he usually had another one in the canoe. What he did was done more than half with his head."

It devolves upon the road foreman of engines to get hold of the fellow with a surplus of muscle and a lack of head capacity, and lead him to a realization of the simple fact that it is what a man can do with his capacity to think that produces results rather than his muscular prowess, and through this capacity of discernment and the ability to lead others into the right way of thinking, which will of necessity bring about the right way of acting, the road foreman of engines can, in my opinion, do more to increase the net earnings of the railroad than in any other way.

Another very important item to my mind is the intelligent reporting of necessary work to be done on the locomotive, and I believe this item is the cause of one of the greatest losses to the mechanical department of a railroad. Every road foreman of engines has noticed in looking over the work book a whole page of work which either was not needed or reported in such an unintelligent manner that it would be necessary for the roundhouse force to tear the engine all to pieces in order to find out what work was necessary to be done, reporting as follows: "Examine cylinder packing," "examine air pump," "examine injectors," "engine does not steam." Such items are frequently found on the work book, not specifying any particular thing nor giving the roundhouse force any information as to where to find the trouble, thus causing a large expense for high-priced labor in finding the trouble, which could have been remedied at a small percent of the cost if the report had been made out intelligently, so that the man doing the work could have gone directly to the job and done it. By properly educating the engineer to report his work intelligently so that no time will be lost in looking up the defects, the road foreman of engines will be able to get as good results from the engineer's report as from personal inspection.

Another item which I believe should not be lost sight of is carelessness on the part of the engineers in handling the engines in their charge. Some of them do not seem to consider it necessary to pay particular attention to keeping the sand in operation to prevent unnecessary slipping of the engine in starting a train or on a hill, nor do they always consider the amount of fuel that is unnecessarily burned by slipping the engine. It is a frequent occurrence to find loose nuts or leaky pipes that could have been tightened by the engineer on the road if he would improve the opportunity to do a little work on the engine instead of ignoring any little job that could have been done by him. In fact, too many of the younger engineers are entirely helpless when it comes to doing what is considered a locomotive engineer's duties, such as keying up rods, setting up wedges and reporting work intelligently on the engine. In many instances engine failures are caused on account of the engineer or fireman not doing the right thing at the right time, and the expense of these engine failures is enormous to the railroads when it comes to figuring up for the engine and train crew and the delay to traffic.

The opportunity for the road foreman of engines to increase the net earnings is much better if he has direct charge of the men under him, and they should know that if they do not follow out his instructions they would be subject to discipline or dismissal. If the road foreman of engines must report irregularities he finds on the road to the master mechanic, it does not give him an opportunity to handle matters to the best interests of the railroad, for many times when he finds enginemen neglecting their duty, if he is not in a position to correct it right then and there, the value of his services is very much impaired by having to make a report of the conditions to the master mechanic and then have an investigation held over a matter that should have been corrected at the time of the occurrence.

The road foreman of engines should study human nature in order to know his men. He should get the men to feel that he is interested in them and get them interested in him, and he will get them interested in their work. We are all human. I have never yet met the person who did not appreciate a word of commendation. I have never yet seen a fly that did not prefer a small quantity of molasses rather than a large quantity of vinegar. By this, I do not mean that wanton disregard of regulations should be winked at or condoned, but when it is necessary to reprimand, if you will control your passions and not speak in an angry tone to the one you are called upon to discipline, but keep your self-control, recognizing that the one you are called upon to punish is like yourself a human being, and will treat him in the way you want your superior or executive officer to treat you when you make a mistake, you will get better results out of the discipline and will find that you are working directly in the line of increasing the net earnings of the railroad. Harmony has never been attained through fighting or by war in any of its modifications. Harmony is had only through gentleness and dealing justly with one another, and along the lines of doing unto others as we would be done by, and in doing this we will avoid the unjust criticism of the other person, regardless of whether that person is employed in the same branch of the railroad service as we or not, and without regard to what his vocation may be.

The committee consisted of: J. McManamy, chairman; Eugene Hartenstein, C. E. Rush, A. G. Turlay, and L. D. Gillett.

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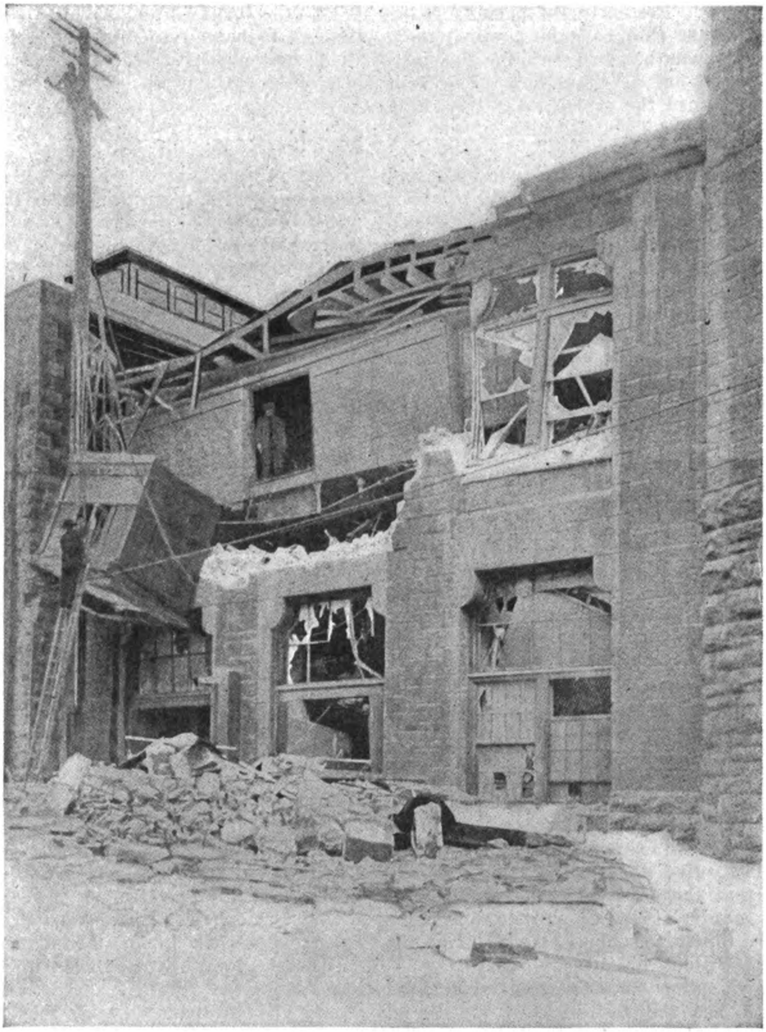
Wreck in Windsor Street Station, Montreal, Canada.

Travelers rather expect to hear from time to time of railroad collisions, but there is something distinctly astounding to hear of such a wreck as the one which occurred to the Boston and Maine train on the Canadian Pacific Railroad in Windsor Street Station, Montreal, Canada, March 17, 1909. The death rolls have been greater and the destruction of property has leaped to higher sums in some other accidents, but the story of this wreck will stand out as one of the most dramatic in the annals of Canadian railroading.

Bro. Mark Cunningham, a member of the Brotherhood of Locomotive Engineers, was the engineer on the ill-fated train, and Bro. Louis Craig, of Lodge No. 747, was the fireman.

After the train left Westmount station a washout plug was either blown out or a broken spring hanger lowered one side of the engine and caused the driving wheel to strike the same and knock it out. Brother Craig testified at the coroner's inquest that the explosion was terrific and the report as loud as a cannon's. When he found he was being scalded to death he concluded the boiler had burst, and he threw himself out of the side window. Brother Cunningham remained for a few moments in the cab in a vain attempt to apply the brakes, while he was being literally boiled with the escaping steam and water. This was an act of genuine heroism with few parallels in the history of railroading. The train speeded on its way to the city, and the human load on board was quite unconscious for a while of anything unusual. The railroad men along the road, however, realized that there was some-



WRECK IN WINDSOR STREET STATION, MONTREAL, CANADA

Showing ladies' waiting room, with the baggage car, after fast running express train of the Boston and Maine Railroad crashed through outer wall. Six persons were killed and many wounded

(From The Standard, Montreal, Canada)

thing wrong. When reaching the suburbs the train passed like a tornado the stations where it was scheduled to stop, and in defiance of the rules which say that "speed must not exceed five miles per hour." Presently the passengers became aware that something was wrong. The city was being passed like the fleeting scenes of a panorama. The conductor pulled the air signal but received no response. The brakeman opened the conductor's valve, but the train hurled into Windsor Station and with a sound that might be likened to rolling thunder crushed the bumping post and ripped through two waiting rooms before coming to a stop. Five lives were sacrificed and fifteen men and women more or less injured. Brother Cunningham, who was picked up on the right of way and taken to the Montreal General Hospital, died the following day without regaining consciousness.

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Railroads Scour Country for Adequate Tie Supply.

That the humble railroad tie is a most important factor in the material development of the country is a great truth that is little understood by people outside of railroad circles. The puffing engine that speeds at the rate of a mile or more a minute over the country is a slave to the two steel rails that insure a smooth and safe road, and these rails in turn depend on the old-fashioned wooden cross-tie which holds them in place.

Yankee invention has not yet found a substitute which has induced the railroads to give up wood, although experts say that the day will surely come when the country's forests will no longer be called upon to supply the demand for ties. Up to the present time it seems that no other material has been found which has the resiliency of wood and which at the same time causes less wear and tear on the rails, fastenings, and roadbed.

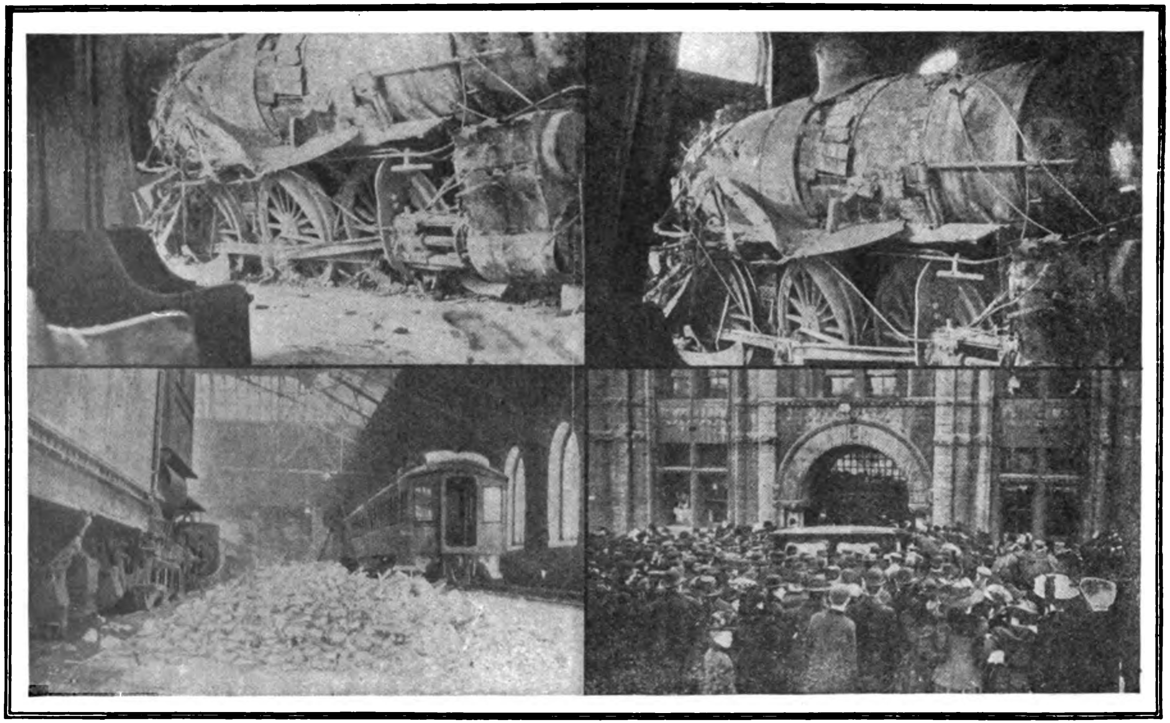
The country's railroads during the last two or three years used 110,000,000 to 150,000,000 of sawed and hewn ties a year. The ideal tie timber is white oak, which combines the qualities of durability, hardness, strength, and close grain. It is not only excellent for ties, but is widely used in ship building, for general construction, in cooperage, in the manufacture of carriages, for agricultural implements, interior finish of houses, and for furniture. On account of this wide use, the supply has been greatly reduced and some of the railroads have been forced to pay almost prohibitive prices for ties, or to substitute other and cheaper woods to replace the white oak ties rapidly disappearing from their lines.

Over 40 per cent. of the ties recently purchased by the railroads of the country are oak, according to latest statistics of the United States Forest Service. Cross-ties of Southern pine formed somewhat less than 25 per cent. Douglas fir ties ranked third, with approximately 10 per cent. of the total. Naturally the proportion of these two timbers will increase as the supply of oak dwindles. This is also true of cedar, chestnut, cypress, Western pine, tamarack, hemlock, and other trees which are coming into the market as tie timbers.

Cedar, which is very durable, has been extensively used to take the place of white oak for ties, but it is so soft that it is readily cut by the rails. This necessitates the use of tie plates and other protective devices when cedar ties are used. As the supply of cedar is also running short, it is necessary for the railroads to seek further for new tie timber. One of the woods which has all the requisites of a good tie, with the exception of durability, is the beech.

A beech tie generally consists largely of sapwood, which partly accounts for its lack of durability, but, on the other hand, allows a thorough and easy preservative treatment. In Germany and France, beech ties have been successfully preserved from decay, and are used very extensively. Beech is found widely distributed throughout the eastern part of the United States, and at the present time is comparatively cheap and abundant. If, therefore, the railroads whose lines are located in the regions where beech is abundant can make use of this wood, treated with some suitable preservative, another source of supply of tie timber will be opened up.

Stumpage values have been increasing so rapidly during the last few years that many railroads have found it necessary to modify their timber policy, and they yearly apply preservatives to a greater number of ties and to more kinds of wood. Substitute woods naturally vary with different sections of the country, but in most cases they lack the two



WRECK IN WINDSOR STREET STATION, MONTREAL, CANADA

The two upper views show the debris in the general waiting room, and the wrecked locomotive. Lower left-hand view shows end of wrecked train in train shed and wrecking crew close at hand. Lower right-hand view shows crowd at main entrance watching ambulances removing the victims

(From The Standard, Montreal, Canada)

essential qualities found in white oak, namely, resistance to mechanical wear and to decay. Experience proves that wear can be successfully retarded by the use of tie plates and other mechanical devices, and decay can be postponed by the application of proper preservatives. The new conditions have made it necessary for many railroad companies to meet the problem of preservation by establishing treating plants at central points of distribution along their lines.

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*Signal Lights.**

There is probably no subject which deserves greater attention from those responsible for railway management than that which relates to signalling. The principal thing which makes this true is the fact that upon the correct setting and correct interpretation of signals depend the lives and safety of passengers and employes. If a certain headway is necessary under certain given conditions, then that headway may be reduced when the conditions guarantee an increase in the certainty with which orders may reach to the engineer. These things are true at all times, but especially so at night. The present article deals with the relation of the engineer to the signal colors now in general use for signal lights at night.

First, let us consider the colors themselves. The subject has received considerable attention from Prof. George M. Stratton, of Johns Hopkins University, Baltimore, who is an expert in the psychology of vision. Red is the color of danger, and when displayed should be capable of arresting the instant attention of the engineer. This employee's duties are so many and demand such alertness and such quickness and soundness of judgment that a signal light warning of danger should not present a problem to be worked. For some reasons red would appear to be a good color. It has a distinctness of hue that is no doubt very valuable. At the same time, it cannot be denied that it labors under a very serious disadvantage. A red light is ordinarily a dim light, as compared with the intensity of the flame generating it. In order to make this clear, attention is called to the fact that the light which proceeds from the flame is composed in reality of a number of colors. In producing the red signal light the usual method is to place a red glass in front of a flame made from oil or by other means. This red glass stops all the other colors and permits red alone to pass. Such a method cannot, of course, do otherwise than weaken greatly the amount of light that reaches the engineer's eye. All the light stopped, or strained out, is rendered useless. Only the red rays which the "strainer" allows to pass are serviceable.

It appears that about four-fifths of the light is thus destroyed, leaving one-fifth for actual service. But Prof. Stratton has found reason to question whether even this much is really available. He finds that if a white light be reduced to the point where it is just visible and then strained by a red glass, no light at all will be visible. This is as we should expect. But then he tells us that he has never been able to get visibility for the red with less than an increase of eighteen times in the laboratory.

Experimenting outside over a stretch of 4,000 feet and under conditions by which the red was favored relatively by smoke, he has never been able to get visibility short of an increase of fourteen times. These he states to be the best results. On the average the light has to be increased about thirty times to bring out the red. This is not a question of color-blindness, but of the relative value of red and white lights for normal persons. Whether this same average of relative value would be increased or decreased for stronger lights, we are not told. This is apparently an important condition which it would seem should be tried in some future experiments. In the meantime, however, it is not to be denied that red is probably an exceedingly weak light under all conditions as compared with the intensity of the white light back of the glass. The matter seems to vary for different persons. He mentions the case of a man capable of passing the regulation color examination who was unable to detect the red light until the intensity was made seventy times that required for the white.

The ordinary white light and for safety signals is bright and consequently effective from the point of view of intensity, but it meets with objection for another reason. That is, it is the same light as that used by the public generally. Consequently, when a white safety signal is really out and the engineer should be on the alert because of its absence, he is liable to think he sees it and has a safe track because of an ordinary house-light burning in a dwelling nearby or in line with the usual location of the safety light. Prof. Stratton cites the case of the wreck at Whittenton Junction, Mass., several years ago. Here the engineer thought he saw the safety light, only to find upon collision with another train that something was indeed wrong. The lantern depending from a street-crossing gate had been mistaken for the safety light. Another instance occurred in the South. A light in a bay-window was in line with the railway safety light. This house light the engineer mistook for his safety signal when one night the latter was in reality out. This mistake entailed a serious accident.

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*By J. F. Springer, in Railway and Locomotive Engineering.

As was stated before, smoke favors red. Indeed, it has the effect of giving a reddish cast to white lights. This would hardly be considered dangerous as it would merely lead to overcaution, unless, indeed, we take into account the psychologic tendency of rendering a man careless who has been often made alert to no purpose by safety lights showing reddish. But smoke has a very serious effect upon green lights, tending to render them pale and ineffectual. They are then liable to be mistaken for white safety lights, and so lead to trouble.

Now, if the difficulties arising from the lights themselves are so great, it becomes a question of very great importance that the eye to which they are presented shall be fully competent for its duty. But what is that duty? Is it simply to be able to tell green from red and yellow, and so on? By no manner of means. The engineer is oftentimes called upon to discern correctly a light and do it with quickness and certainty. This must be accomplished in addition to the performance of a great multitude of other duties. In the engine-cab he has something more to do than merely assort skeins of worsted and the like. His attention is taken up with many things. It is requisite therefore that the appeal of the signal be emphatic. But, then, the light itself may be burning dimly or the glass may be covered with the effects of smoke. Or, the atmosphere itself may be full of mist or rain or snow or smoke. Instead of a bright red light there may be a dimly burning flame losing the bulk of its rays at the smoky, red strainer, and compelled to send the feeble remaining rays through a cloud of smoke and haze. If these reach an engineer who is with difficulty able to pick out the colors when in a comfortable room with the examiner, and having all the time he requires, can we expect that he will be put sharply on the alert for danger?

How about the man who cannot be described as color-blind and who is yet to be considered normal? He is technically known as the "abnormal." He can distinguish the colors, if the conditions are good. But if the conditions are unfavorable he is very liable to fall into error. Such men are usually able to discern correctly the three colors, red, green and white, when the light is fairly strong and some little time is given, provided the colors are shown separately. When combinations of colors and also combinations of brightness are presented to them, they are apt to become confused or irresolute.

This subject of the unreliability of the so-called "abnormal" man has received the expert attention of one of the most prominent of the psychologists of Germany. Prof. W. A. Nagel is the editor of Zeitschrift für Sinnesphysiologie and is himself color-blind, being a green dichromate. But his experiments, not upon the color-blind, but upon the color-weak, the "abnormal," are of importance as helping to elucidate an obscure subject. Prof. Nagel seeks to imitate very closely, conditions as they are realized in actual service, although his experiments are laboratory ones. Thus the varying distances of a signal light he imitates by passing the light through holes of varying sizes. In fact, he uses six different sizes of field varying from about 1-25 inch in diameter to about ¼ inch. To vary the intensities, he uses ground glass, inserting one or two pieces, then securing in all three variations of intensity. Combined with the six variations for distance, he is thus able to produce for each color 18 combinations of intensity and distance. The colors are obtained by standard railway glass.

The table which is subjoined represents three experiments upon three different subjects, none color-blind, but all "abnormal." The letters used indicate the colors, the numerals after the letters, the size of field (representing six varying distances). The mark (′) and (″) are to be understood as indicating degrees of dimness, secured by inserting one and two pieces of ground glass.

It will be observed that mistakes were

made. Thus in experiment No. 12, a dim and "distant" red (r2″) is actually called green after the subject apparently began by calling it correctly, but subsequently changed his mind. The same person calls a "nearby," but dim, white (w6″) a green. In the other experiments errors are also made of a similar character. These are for lights shown separately. Upon considering the displays of three lights at a time, there are numerous mistakes to be found. This is the point where the "abnormal" is very weak, that is, where differently colored lights are simultaneously shown.

table are these numbers. This aspect of the question of signalling is full of difficulty. Perhaps the ideal thing to do would be to abolish colored lights and adopt a suggestion of Prof. Stratton. He thinks that there should be movement of the signal, as motion is something to which we are all very alert. Or, to have a luminous signal whose form would convey its message, as for instance, a horizontal, a slant and a vertical line of light. These lines would of course have to be brilliantly illuminated.

Perhaps the best method would be automatic devices operating in case of danger to bring the train to a standstill independently of the engineer. Such a device is used in the Hudson tunnel and in the New York subway and on the Boston elevated. A device which would make it impossible for the railway train to proceed in the face of danger is the ideal danger signal.

Experiments Upon Three "Abnormals" or Color-Weak Persons.

Experiment 12. Subject: K. (red-abnormal).		Experiment 15. Subject: S. (red-abnormal.)		Experiment 14. Subject: Dr. A. (green-abnormal).	
Shown.	Named.	Shown.	Named	Shown.	Named.
w 2	w	r3 r4 w3′	r? r? g	g 3	w
r 2	r	w3 g4 g3	r w(g) w(g)	w 5′	w
r 3	r	g6 w6′ r3	g w r	r 3′	r
g 3	g	r6 r6 w3	r r g	g 2	g
g 2	g	r5 r3″ r6	r g r	g 4′	g
w 1	w	g6 g3″ g6	g g g	g 6″	w
r 4″	r	w2 r3 w6	? r w	r 6″	r
r 2″	(r?)g	w4 r6 w6″	g r g	w 5″	r(w)
g 1	g	w2 w6 w6	? w w	g 3	r
r 2	r	r4 r2′ r6	r g r	g 3′	r
r3 w3 r3′	r w g	r6 r2′ r6	r g r	w 3″	g
r2 w2 r2	r(g) w g(r)	r 2	r ?	w3′ r4 r5	g w w
r2 w1 r2	r g r	g 6	g	w3 w5 w6′	g g w
g 1′	g	g 5″	g ?	r3 r5′ r6′	r r r
w3″ r3 r3	g r g	r 2	r	r3 w5 r6	r g r
r3 w3″ r3	r g g	w 4′	(w, r?)	r6 w6″ r6	w g r
w3 w3″ w3	w r w	w 2′	(w, g?)	r6 r3″ r6	r g r
g3 r3″ g2	w r g	w 3	r		
r6 w3″ r5	(w)r g r				
r6 w3 r5	r w r				
w3″ r3 r5	g r(g) r				
w3″ r3 r5	g r (g)r				
w6 r6 g6	g r 6				
w 6	w				
w 6″	g				

What the table does not show very well, and what Prof. Nagel emphasizes is the vacillation of the "abnormal." Thus where the table may indicate the correct reply, observation of the subject frequently showed that he was very hesitant.

The exact apertures were 1, 2, 3, 4, 5 and 6 millimeters. The numerals in the

*Western Railroad Activities.**

To Reduce Operating Expenses.—At a recent meeting of representatives of the National Lines of Mexico, held in Mexico City, it was decided to spend $12,000,000 on improvements on the Mexican Central and for widening the gauge of the Interoceanic road. It is estimated that the recent changes which have been inaugurated as a result of the merger of the big systems of Mexico will reduce the operating expenses of those lines by about $10,000,000 yearly, a sum almost equal to that which it is decided to devote to the improvement on the roads. The establishment of the joint agencies means a saving of $150,000 a year, and this includes the abolishing of the office of president of the Mexican Central, which carries with it a salary of $40,000 a year, and also the offices of general manager, general freight agent, claim agent and general passenger agent, as the one official will now look after the joint interests of both roads.

Will Close the Gap.—There is scarcely a doubt but that the gap of 105 miles between Sherwood, in Mendocino County, California, to Pepperwood, in Humboldt County, will be closed. When this gap has been closed there will be uninterrupted railway connection from the northern shore of San Francisco Bay to Eureka on the coast in Humboldt County. General Manager E. E. Calvin, of the Southern Pacific, in speaking of the building of this road said: "There is a surveying party now in the field working on the most difficult part of the proposed line in the canyon of the Eel River. Our original surveys were destroyed in the fire, and it was necessary to have all the work done over again. The part of the route where the surveyors are now working will be the hardest piece of canyon construction in the United States."

New Kind of Steel Platform.—Bartholomew Julien, master car builder of the Union Pacific Railroad at Omaha, and William Paint, his chief assistant, have very recently invented a new kind of steel platform for baggage and mail cars. The latter includes steel end construction connected with a rigid floor frame, roof and sides, with braces so arranged as to take up and distribute the force of a blow in a collision. Resistance to a pressure of 750,000 pounds is claimed for the center of the passenger car platform. This new kind of platform is meeting with much favor among practical railroad officials.

An Enormous Tie Order.—Some idea of the territory through which the Pan-American Railroad runs may be formed from the fact that a 3,000,000 tie order has recently been placed by a firm dealing in ties to be cut from a strip of land 30 miles long through which the railroad passes, embracing 52,000 acres. It is located in the State of Chiapas and is covered with fine Spanish cedar forests.

Will Do Rapid Railway Work.—General Manager Chamberlain, of the Grand Trunk Pacific Railway, has been making a general inspection tour of the Northwestern territory on the Pacific coast. Mr. Chamberlain says: "Our company expects to expend about $10,000,000 during 1909 on construction. The first hundred miles east of Prince Rupert, the Pacific terminus, is now under contract and will be finished by September 1, 1909. On that date a contract will be let for 140 miles further eastward, which will take the road well into the mountains. Between Winnipeg and Prince Rupert there are only 260 miles not yet under contract. Trains will be running from Fort William to the Rocky Mountains by late this fall—a distance of 1,700 miles."

Work on the Ocean Shore Lines.—Work on the Ocean Shore Railroad is being crowded forward with all haste, and it has been confidently expected by the company that the entire line would be completed and in operation by the first of the current month. This is essentially a coast line and extends from San Francisco to Santa Cruz, the entire distance from tide water to tide water being 84 miles. Active construction operation was commenced on this road about three years ago, but owing to the unsettled financial conditions that have prevailed the work has progressed slowly. The building of this road has involved some very difficult problems of railway engineering and has proved unusually expensive to the company. Work was commenced simultaneously at both San Francisco and Santa Cruz, and the construction forces have operated each toward the other. This new line passes over an exceedingly rich region, the greater part being already in a high state of cultivation. The company is an independent one, a number of prominent San Francisco capitalists being interested in the enterprise. Reports have frequently been circulated that the Harriman interests were behind the road, but all such statements have been emphatically denied by the Ocean Shore officials. For more than a year past trains have been constantly running at each end of the line. The unfinished gap is now very narrow and will soon be closed.

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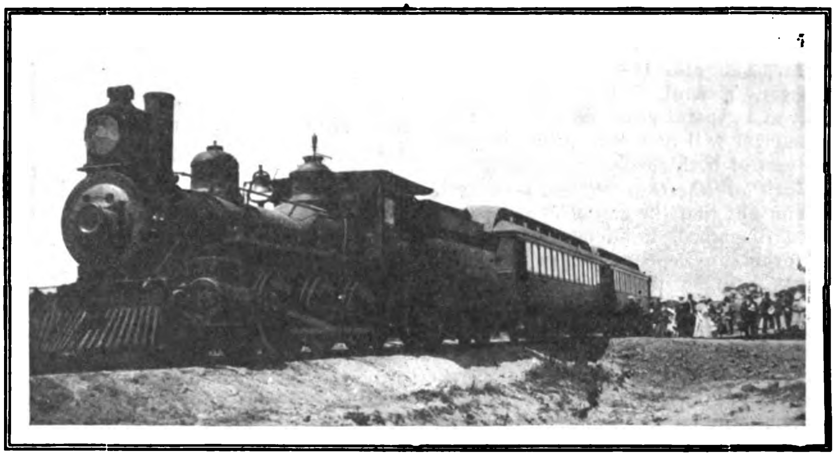
*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

The Rocklin-Colfax Cut-Off.—Three thousand men are now at work on the Rocklin-Colfax cut-off of the Southern Pacific, and boring has started on the 3,000-foot tunnel above Applegate. The work already done will require $4,500,000 to complete, and it is estimated that the entire cost of the Rocklin-Colfax cut-off will reach nearly $10,000,000.

Big Bridges to Be Replaced.—The announcement has been made that the Western Pacific Railroad Company will very soon replace its present steel bridge across the American River at Sacramento on account of defects shown in the structure as a result of the high waters of the past winter. The chief damage consisted in the carrying away of two spans by the great rushing floods through the collapse of one of the piers. The present bridge is built of 80-foot steel girders seven feet high, and they are set upon clusters of piling. It has been clearly demonstrated that these clusters are not set at right angle to the stream, so that they are to be replaced with massive concrete piers, the foundations of which will be placed far below the bed of the stream and will be less exposed to the great force of the current. There will be two spans, each of 160 feet, in midstream, which will reduce the number of piers. The Southern Pacific Company is taking soundings for the new double-track bridge that is soon to replace its present bridge across the American River only a short distance above the Western Pacific's new bridge referred to above. Work on the Southern Pacific's new structure will be commenced soon. Its estimated cost will reach $600,000.



PASSENGER TRAIN ON OCEAN SHORE RAILWAY LEAVING GRENADA FOR SAN FRANCISCO

Two Monster Engines Received.—The Southern Pacific Company has lately received from the East two of the largest locomotives in the world, and they have already been placed in service on the mountain division east of Sacramento. They are of the Mallet articulated compound type and surpass any foreign make in size and hauling capacity. They weigh 394,000 pounds each and have two sets of cylinders. They are capable of hauling almost 2 3/10 larger trains than the next most powerful locomotives in size. These steel and steam giants will be used in the freight service, and it is expected they will be an important factor in evening up the Southern Pacific and the Western Pacific in the matter of economy in crossing the Sierra Nevada Mountains, the present mode of the older road being to hitch two or three locomotives to one train to haul it up the heavy grades, while with the Western Pacific one ordinary locomotive will haul an ordinary train over its steepest grades.

Immense Railway Construction.—According to the best railway engineering authority there are now more miles of construction in the "Inland Empire"—including something like 150,000 square miles of territory in eastern Washington, northern Idaho, western Montana, northeastern Oregon and southeastern British Columbia—than in any other similar area on the whole American continent. The railway mileage in the State of Washington alone is 1,500 miles, and the work in the three other states and provinces mentioned will bring the total to 3,000. Approximately 650 miles of line were built in Montana last year (1908), when that state headed the list in the Union (for one single state) for new work accomplished. There are at present 4,595 miles of main line branches, yard tracks and sidings in Washington, which was second in the list of new road construction with between 500 and 600 miles. The completion of the main line of the Chicago, Milwaukee and Puget Sound will add much more. In addition to this approximately 1,100 miles of steam and electric lines are projected to be completed before the close of 1911.

More Surveys Being Made.—Engineers are now engaged in making surveys for the Chicago, Milwaukee and St. Paul up the Blackford River and through the Clearwater country to Ovando, 65 miles east of Missoula, Mont., and 45 miles from Drummond, the nearest railway station, and will follow a straight line northward up the Swan River to that place, 100 miles. The Northern Pacific also has a surveying party out for the same purpose, and both are at work along the east side of Flathead Lake, where, it is announced, the Great Northern has also had surveys made.

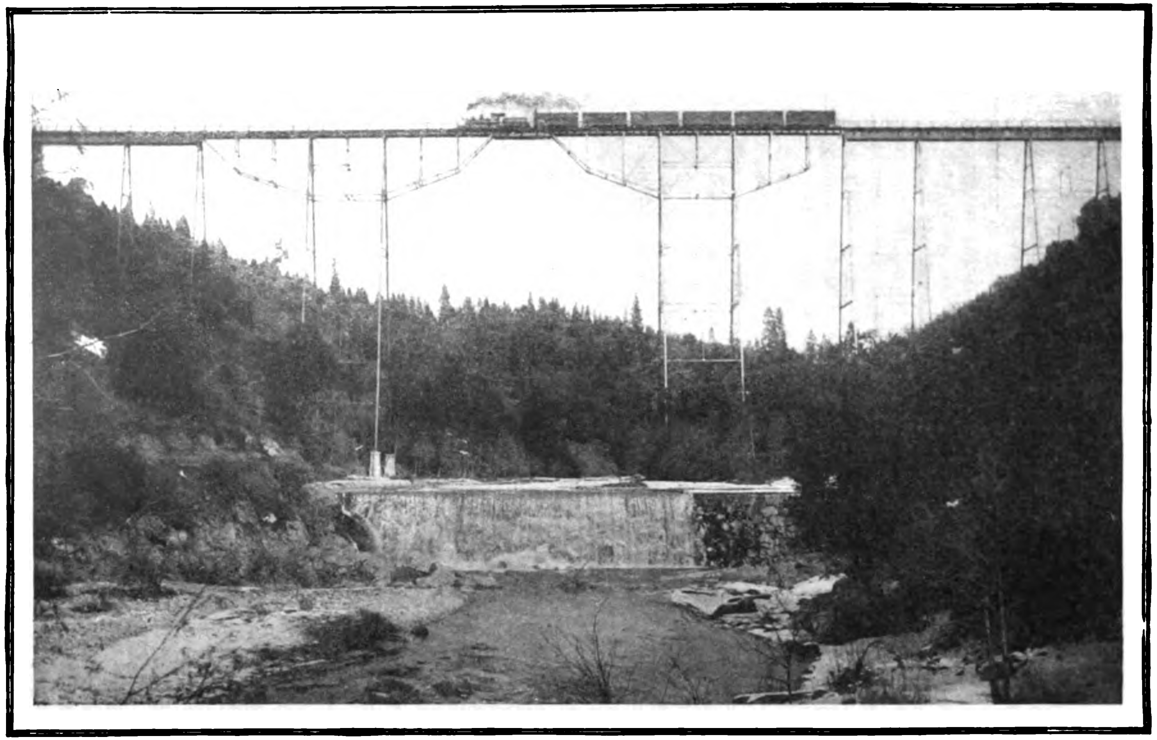
Rival Roads Make Peace.—The rival fight between the North Coast and the Northern Pacific railroads in the lower Yakima Valley, Washington, has practically been abandoned, and the work on the North Coast will be pushed from now on. This statement has been made by President Robert E. Strahorn, of the North Coast, while in North Yakima. It is expected to have the North Coast completed into Yakima by January 1st and 100 miles of road in operation by that time.

Western Pacific Track Laying.—Track layers on the Western Pacific have reached Palisade, Nev., thus making 290 miles of track laid between that point and Salt Lake City. There are still 100 miles to lay between Palisade and Winnemucca. At the latter place a new gang has been put on and is working westward toward the California line. Another gang is working in the vicinity of Beckworth, so that three gangs are now laying track, and a fourth will be put on soon. It is predicted that track laying along the entire system will be finished in four months. The company has awarded a contract to G. D. Patterson & Co. for a ferry building on the Oakland mole, and work will start at once. D. H. Burnham & Co. are the architects. The total contract price is to be $100,000.

To Build a Branch.—At a meeting recently held by the board of directors of the Chicago, Milwaukee and Puget Sound Railroad a resolution was adopted authorizing the construction by that company of a Montana branch which will secure a certain route into the Flathead Indian country. The resolution calls for a line extending northward from Bonner through Missoula, Powell and Flathead counties to the international boundary line, a distance of approximately 200 miles. This is what is known as the Swan River route and will connect the Northern Pacific and Milwaukee on the south and the Great Northern in Flathead County, as well as tapping the rich coal and mineral fields of southern Canada.

More Lines in Mexico.—American and English capitalists have received a concession to build a railway from Mondosa, on the Mexican International, to the city of Chihuahua, a little over 400 miles. This proposed new line will pass through an exceedingly rich mineral belt, and it is claimed that the agricultural possibilities of that territory are fine. The preliminary survey was made by J. M. Reid, chief engineer of the National Railways of Mexico, some months ago. Work is to be commenced with the least possible delay. The road must be built and in operation within five years according to the terms of the concession.

A Road to Cross the Rio Grande.—The San Antonio and Rio Grande is now in operation from Ebenezer, a point on



TRAIN CROSSING NEW STEEL BRIDGE OVER BEAR RIVER, NEAR GRASS VALLEY, CAL., ON CUT-OFF LINE OF THE NEVADA COUNTY NARROW GAUGE RAILROAD the San Fordyce branch of the St. Louis, Brownsville and Mexico to Chapin. There is every indication that the road will be built across the Rio Grande from Ebenezer, connecting with the National at Reynosa. This will give the new line a direct route into Mexico, and will enable it to compete successfully with the International and Great Northern and St. Louis, Brownsville and Mexico, both of which have connection with the Mexican lines.

Highest Railway Bridge in California.—The accompanying photograph shows one of the trains of the Nevada County Narrow Gauge Railroad Company crossing what is the highest bridge in California. This is a new bridge recently completed by the company named at a total cost of approximately $90,000. With the exception of the ground foundations (which are of concrete) the entire structure is of structural steel. This bridge is pronounced by engineers to be the highest bridge, railway or otherwise, in California. The track is just 200 feet above the waters of Bear River at mean low stage. Recently the N. C. N. G. R. R. built a cut-off near Grass Valley, securing a better grade and shortening the distance nearly three miles. This rendered the building of the new bridge across Bear River necessary. This structure takes the place of an old wooden one which was only 100 feet high above the bed of the stream. Nearly six months were required to construct the new bridge, and it proved a difficult and dangerous engineering task. There are no approaches to this bridge, the opposite banks being very high and abrupt. From abutment to abutment is 800 feet.

Old Railroad to Be Rebuilt.—It is now stated on good authority that the Southern Pacific Company will soon rebuild the old Marysville-Folsom Railroad, or at least that part of it which has been torn up. That part lies between Roseville and Fair Oaks. The Marysville-Folsom line was one of the first railroads built in California, and was used away back in the early days when there was an immense traffic between the mining camps along the western slopes of the Sierra Nevadas. When these great placer mines were worked out the railroad filled other needs to a larger extent, and the traffic was greatest to Sacramento. This, with the building of other lines, caused the portion of the road between Roseville and Fair Oaks to be torn up. The Marysville line was taken to Sacramento by direct route from Roseville, and Tolsom was reached from Sacramento by another line. The old roadbed between Roseville and Fair Oaks is still in existence.

New Railway Company Formed.—A company has been organized at Sacramento, Cal., to be known as the Sacramento and Sierra Railroad Company, with a capitalization of $1,000,000. The purpose is to construct a road from Sacramento to Lake Tahoe, the total length of the line being 127 miles. The route will be via Orangeville, Georgetown and Jackson's Springs. Its terminal in Sacramento will be on the water front, and the company has already secured a large acreage there for yards, factories and shops. This independent company will also engage in the lumber industry and operate steamers on the Sacramento River, San Francisco Bay and elsewhere. The company expects to commence active construction work in the very early future.

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Railroad Signaling and Interlocking.[*]

It is but 75 years since the only method of signaling the movements of trains was accomplished by means of a horseman preceding the train waving a flag. This arrangement might have been fairly satisfactory if the horse had been Teddy or Sam, but England never saw this type of animal until Cody carried them there by rail and boat.

The next step was the placing of fixed signals along the line, consisting of a pole carrying a movable arm working in a vertical plane; the horizontal position indicating stop; the inclined position below the horizontal indicating safe. We have followed this form of indication, and in doing so have been too English. We should have commenced our signaling by indicating the safe position above the horizontal, and it is apparent that we blindly followed English practice at great first cost and continuing increased operating expense.

The most important principle of signaling requires that any failure in the apparatus will cause the signal to show danger. The fixed signal called the semaphore, as designed in England and now in general use here, requires a heavy counterweight so as to bring the arm up to the danger position in case of failure in the operating force as well as to overcome the weight of snow or ice which may accumulate on the blade. Consequently, more power is required to pull the signal to the clear position. Had we taken the position above the horizontal no counterweight would be needed and any accumulation of ice or snow would tend to put the signal to danger rather than safety as in the English practice.

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[*] By Charles Hansel, in Railway World.

Interlocking Machines.

Following the working of the semaphore came the necessity of working the switches from a central point or cabin and the combination of levers and connections to operate signals and switches in such manner as to insure that the switches on the route governed by the signal were locked in proper position before the clear signal could be indicated. In order to accomplish this the interlocking machine was invented. The levers which are connected to the various signals and switches are grouped together in a frame and so interconnected as to make it necessary for the operator to move the levers in the proper sequence in order that he may clear the signal for the route desired; each lever is numbered to correspond with the numbers shown on the several signals and switches shown upon a chart hanging in front of the operator, which, together with a manipulating chart, furnishes the necessary information for manipulating the levers. The operator cannot clear a signal until the route is set, consequently he cannot organize an accident, therefore he is protected against his possible ignorance or inattention.

Grade Crossings.

The crossing of one railroad with another at grade is a common condition in this country. This offers a dangerous condition which may be fully protected by a system of signals, derails, etc., which enables trains to proceed over the crossing at speed and with safety. The installation requires, for a single line crossing, eight signals, four of which are erected about five hundred feet each way from the crossing. These four signals are called home signals. Beyond the home signals, a distance of 1,500 feet or more, are located the distant signals. If we were certain that signal would be obeyed at all times we would need no further protection; but we have not yet arrived at a degree of efficiency in discipline which insures that trains will never be run by a danger signal. It is the general practice in this country to provide a derail at the home signal, which is opened after all signals on the route are placed at stop. This derail is an ordinary switch point and if a train attempts to proceed to the crossing against a stop signal it is derailed. This seems a brutal method of compelling the observance of a signal. Experience has demonstrated, however, that the derail is a moral agent and is effective in its presence and is seldom called upon to perform its office. A clear signal cannot be given for the crossing until the derails on the opposing route are open, and the signals on that route are in the stop position and the signals cannot be pulled to the safe position on opposing routes.

We must guard against the opening of a switch under a train. This is accomplished by the detector bar. A thin bar 55 or 60 feet long is hung in a vertical position on the outside of the rail at the switch point fixed on links clamped to the rail, and so arranged in the general scheme as to make it necessary for the operator to move this bar vertically above the rail before the switch can be unlocked or moved. If a car or train is standing on or passing over the points the bar cannot be moved because the wheels of the car prevent its rising above the rail, consequently the switch cannot be opened under the train. These bars are also provided on each side of the crossing so as to insure against changing signals where a short train or light locomotive may have passed the home signal toward the crossing but has not passed the crossing. This condition may be better protected by employing a track circuit between derails controlling an electric lock which insures against change of signals until train has passed entirely out of the limits of the derails. Where signals and switches are operated by lines of inch pipe carried on rollers and are compensated for change in temperature by what is known as a "lazy jack" these carriers, compensators and cranks are now usually fixed on concrete foundations.

Draw Bridges.

The protection of draw bridges is perhaps more important than grade crossings and for this work we employ the interlocking machine with the home and distant signals, and where practicable derails are used. The signal cabin may be located either over the pivot pier or on the shore. To insure safety we must insure that before a clear signal is given the rails at each end of the draw are down in place and locked, the draw itself locked to the abutment and the turning mechanism locked and that none of these conditions can be changed so long as the signal shows clear, and in reversing the order of movement the draw cannot be opened until the signals are at danger and the signals cannot be cleared until the draw is again closed, etc. The important device in this combination is the bridge coupler for the pipe lines which must be uncoupled by the operator from the cabin before draw is opened.

Power Interlocking.

In complicated terminals or points where the switches are a considerable distance from the cabin the signals and switches are worked by power. This power is generally compressed air or electricity. The first pneumatic power plant was installed at Philadelphia in 1876, designed by Prall and Burr. This plant was crude and the first efficient plant was designed by the Union Switch and Signal Company. This system used compressed air at 80 pounds for moving the signals and switches, and electricity for giving the return indication and backlocking. One of the first important installations of this system was at St. Louis, which has since been enlarged.

The low pressure pneumatic system uses air at 15 pounds and is a strictly pneumatic machine. This system is the invention of F. L. Dodgson, of Rochester, and was first tried at Buffalo in this country, and in 1901 the speaker assisted in convincing the Board of Trade of England that since that country taught us the beginning in this art we were ready to return the compliment by teaching them the finish.

The all-electric system was installed at Edgewood in 1896, and it bids fair to supplant all other systems. The danger in its use is the inducement offered by the quick action of the power to operate switches and signals too far away.

Block Signal.

The term block signal applies to the wayside signals fixed in the permanent way for the purpose of spacing trains. In England the almost universal practice in blocking trains is to install signal boxes as block stations and operate the signals by hand power, and in order to insure the proper working the system known as the lock and block is generally installed by means of which the operators in the signal cabins are in telegraphic communication, and when a train is admitted to the block no other train can be admitted until the first train has cleared.

This system is excellent but expensive and should include the rail circuit hereafter described. England adopted the Railways Act in 1889 and as early as 1892, 94 per cent. of the switches were interlocked and at this time practically every mile of track is signaled and interlocked.

Automatic Signals.

This country developed the automatic signal and its adoption has been rapid since no later than 1890. There were but fifty-two automatic signals in use, and now there are many thousands. I understand the Harriman lines alone have expended ten million dollars in this branch of their service.

The important factor in the automatic system is the rail circuit which actuates a relay controlling the signal battery circuit. The blocks are arranged as to distance in relation to volume of business, grades, curves, etc. The block section is made by the placing of an insulated joint in each rail at the signal governing block; a track battery is connected to the rails at the opposite end of the block section. The rails are bonded so as to form a circuit from each pole of the battery to an electric magnet at the signal, which is called a relay, this relay being connected to each rail at the signal and controls the signal. The signal may be operated by any fluid pressure and is always operated by a local power controlled by the track relay. The de-energization of the track relay causes the power to be cut off from the signal, which moves to the danger position by gravity. There is some difference of opinion as to whether the normal position of the signal should display stop or proceed. Personally, I prefer the normally clear. If there is no train, open switch, broken rail, short circuit or other break in the continuity of the track circuit the battery energizes the track relay through the rails acting as a circuit; as soon, however, as the first pair of wheels of a train enters the block the relay is cut out because the circuit finds an easy path from rail to rail through the wheels and axle. This causes the armature of the relay to drop and open the signal control circuit and the signal moves to danger and remains there until the entire train is out of the block. An open draw, switch, broken rail, short circuit, will act on the signal the same as the presence of train. There are many refinements and circuits in connection with block signaling which I cannot take time to explain at this time.

Automatic Signals for Electric Lines.

The problem of the track circuit on steam railroads is comparatively simple though there are many vexatious conditions, such as stray foreign currents, etc., to annoy. The block signaling of electric lines is quite another problem, for the reason that since with electricity as the means of propulsion the rails are used for the return and consequently the block must be formed by means of a device which, while blocking the flow of the circuit used to actuate the track relay, must not impede the flow of the propulsion circuit.

The speaker gave much attention to this problem in 1903 and today we find it practicable to provide automatic signals on electric line, the most notable example being the installation of the electric zone of the New York Central. The reactance bond, as connected, forms a path of low ohmic resistance and large current capacity for the propulsion current and at the same time offers an impedence to the passage of the track circuit current from rail to rail, whereby a portion of the track circuit current is forced down the rails to operate a track relay. The traction current on the New York Central is direct; consequently, the track circuit must be alternating, and we have the condition of the rails carrying one current for propulsion and another for controlling signals.

The value of using the rails for the double purpose of carrying the propulsion current as well as the signal controlling current will be appreciated when we know that without such a system one rail must be given up for signaling which means that we must supply its place with a conductor of equal current carrying capacity.

There are two signal companies now equipped to carry out signaling on this plan. The most important installation now approaching completion is the work on the New York Central electric zone costing some two million dollars. The slides which will now be shown illustrate the signaling of the Philadelphia and Western Railroad, followed by the installation on the New York Central electric zone, all of which was installed by the General Railway Signal Company.

Color of Signal Lights.

One of our most difficult problems has been to display the signal at night, and up to this time we have not evolved a satisfactory method of giving uniform signals by day and night. We have form and position to govern by day and change to color only by night. Many efforts have been made to furnish an illuminated blade and in 1888 Stevens Institute awarded the John Scott Legacy Premium Medal to Prof. C. Herschel Kogl for his illuminated semaphore. I have had occasion to install many of these signals and soon found them to be impracticable and the world awaits the solution of this problem.

The general practice now in use is to display *red* for stop and *white* for clear, using *green* for caution. The American Railway Association, as far back as 1894 recommended green for clear. The Signal Club in 1898 voted 26 to 9 in favor of green for clear and it is now generally considered to be the best practice, but the majority of signals are still displaying white for clear. The principal objection to using white for clear is found in the confusion in cities, but more important than all is the possibility of showing white when the red glass is broken, thereby giving an absolutely false signal.

Train Staff.

The train staff was developed in England and extensively operated in India and Australia, but has not met with the reception in this country that it is entitled to. The staff system is applicable only to single lines where traffic is in both directions. There are two dials with indicators on the face of the instrument, which are operated by the turning of a knob shown in the center of each dial.

The normal position of the pointer being vertical and pointing to the words *staff in* on the left hand dial and *for bell* on the right hand dial. In this position both instruments are locked; that is, the staffs which are shown in the body of the pillar cannot be released from the instrument. In order to control a section of block, it is necessary to locate and operate one of these instruments at each end of the section, and for the purpose of describing the operation of this system we will assume that there is an instrument at each end of the section which will be referred to as "A" and "X." These instruments will be connected together with two ordinary line wires and will be operated and controlled by a line battery and a local battery at each instrument. The line battery, of course, will vary as the length of line between the instruments. For ordinary blocks of from four to five miles, it would require about eighteen cells of open circuit battery for the line battery, and from nine to ten cells for the local battery.

The instrument may be provided with as many staffs as is desired, and this will be determined by the number of trains which pass in one direction, say from "A" to "X" before any trains are run from "X" to "A." It is found that fifteen staffs are sufficient for ordinary traffic. The staff takes the place of the ordinary telegraphic train order and with the use of this staff we may abolish the telegraphic train order system, for it will be seen that two staffs cannot be taken out for the same section, at the same time, unless the permissive feature first mentioned is applied.

When a train is ready to move from "A" to "X" the operator at "A" presses down the lever which is seen at the bottom of the right hand dial, sounding one bell at "X," which is for the purpose of calling the attention of the operator at "X" to the fact that "A" desires to send a train forward. The operator at "X" acknowledges the call by pressing the lever on his instrument, sounding a bell in the tower at "A." The operator at "A" then asks permission from "X" to withdraw staff by pressing down lever before mentioned three times giving three rings on the bell at "X," and immediately turns his right hand pointer to the left, leaving it in the horizontal position pointing to the words *for staff*, indicating that he desires operator at "X" to release his instrument so that he can take a staff or train order from it. If there is no train or any portion of a train between "A" and "X" the holding down of the lever "X" closes the circuit in the lock magnets at "A" which enables the operator at "A" to withdraw a staff. As soon as this staff is removed from "A," "A" turns the left hand pointer to the words *staff out* and in removing this staff from the instrument "A" the galvanometer needle which is seen in the center of the instrument between the two dials vibrates, indicating to the operator at "X" that "A" has withdrawn his staff. "X" then releases the lever which he has held down in order that "A" might withdraw a staff and turns his left hand indicator to *staff out*, and with this position of the instruments a staff cannot be withdrawn from either one.

The staff system is now receiving more attention and will no doubt be more and more important on single lines.

Signaling Improves Discipline.

It is believed that the installation of a properly designed system of signaling and interlocking goes far in the prevention of railroad accidents. It cannot be conceded, however, that railroad accidents will cease when all of the railroads in this country are fully equipped. Accidents involving great loss of life and property continue to occur on railroads which are equipped with the best form of visual signaling, both in this country and abroad.

. . . .

Automatic Control.

The next important step in safe railway operation is the automatic control of trains. A satisfactory system must be operated in such a manner as to insure that any failure is on the side of safety. It must be sufficiently flexible to avoid unnecessary interruption to traffic. The control of the train at all times must be within the command of the locomotive driver.

There have been many attempts to design such a system. The subway in New York City, the elevated in Boston and, to some extent, the elevated in Chicago have provided means for the automatic control of trains by mechanical trips fixed on the permanent way. This system is not applicable to surface railroads. Notwithstanding the fact that there has, for some time, been a demand for the automatic control of trains, there has not been offered, up to the present time, a satisfactory system.

Inventors have usually attempted to solve the problem of automatic control by providing a third rail, trips and similar extraneous apparatus, requiring special contact apparatus fixed upon the locomotive—such as a shoe to come in contact with the third rail; or an arm or other device to strike the trip, etc., fixed upon the permanent way. All such extraneous apparatus are objectionable for many reasons and the true principle of a satisfactory automatic train control must dpend upon the presence of the wheels of the locomotive upon the traffic rails without any extraneous apparatus. It must also act in conjunction with the well-known and satisfactory rail circuit system. It must also be designed so as to provide a secret record of the passage of a signal at danger and should operate automatically in case of a train in the block ahead, an open switch, or the interruption of a track circuit from any other cause.

If a secret record is made of each time a locomotive driver disobeys a signal, the objection to the automatic block system will be entirely removed, as such a record would be more valuable than to depend upon the report of the signal operator, as in case of the controlled manual system. Consequently, an automatic train control system, designed on these principles, will materially add to the value of the automatic block signal system.

This system should furnish a visual as well as an audible signal in the cab of the locomotive and should apply the air brakes in such a manner as to avoid shock; and it should be so arranged as to provide the secret record, the visual signal, the audible signal, and the application of the air brakes as a whole, or in part, so as to give the railroads any of these four functions without requiring them to adopt all the functions suggested.

Some objections have been made to controlling trains automatically on the ground that the locomotive driver will depend entirely upon such apparatus and feel no responsibility. This objection may be entirely eliminated by the introduction of the secret record of the passing of a signal at danger and the automatic cab indication or application of the brakes, and discipline is made more effective for the reason that the locomotive driver must answer for each record made and there is no system now in force to check the non-observance of a signal.

Control of Speed on Curves, etc.

The control of the speed of trains at any predetermined point, such as the approach to a curve, a tunnel, a grade crossing, or any point on the road which, for any reason, requires reduced speed, either temporarily or permanently is entirely practicable. With this important adjunct to the automatic train control, we may fix the speed of trains at each curve, tunnel, grade crossing, or any other point where speed should be held within definite limits.

Railroads which are now operating under the automatic block system have installed the track circuit hereinbefore referred to; consequently, the only equipment that they would need would be the fitting up of the locomotive, which can be done at comparatively small cost; and, since each locomotive would be an independent unit, every locomotive so equipped would be a step forward in decreasing the percentage in opportunity for accidents. There are many reasons for continuing the visual signal system and railroads of heavy traffic will, no doubt, continue to use the automatic block system in conjunction with the automatic train control.

Railroads which are not provided with any system of block signaling, and have not the financial means to install such a system, can employ the automatic control system without the installation of the block signal system by installing the track circuit in whole or in part; and all *curves or other points of danger may be absolutely protected immediately.* Railroads of small means can install the automatic control apparatus for controlling the speed on curves, as well as to protect against open switches or collisions at such points.

Responsibility on Locomotive Driver.

The locomotive driver in England is furnished a complete description of every signal, switch, catch-point, junction, etc., on his run, and he must familiarize himself with every foot of track before he is entrusted with the run. This book, in many cases, contains more than five hundred pages. I believe if the Railway Association would select a committee of locomotive engineers and send them to England and the Continent they would return with a higher appreciation of their work here, to the benefit of themselves, their associates, the traveling public and the shareholder.

Mountain Railways.

I have been requested to describe the new system of mountain railway which is now under consideration between Encampment and Battle Basin, Wyoming. This system depends for traction upon the gripping of the side of the head of the rail by horizontal driving wheels, so arranged as to automatically increase or decrease the power of the grip in harmony with the pull on the draw bar, which, of course, varies with the load. The motor and cars are carried by vertical wheels with double flanges running on the top of the rails. The balancing of the train being accomplished by outside wheels running on the ground or on rails if desired. The body of the car is carried down to within a few inches of the rail so that the center of gravity is very low, carrying 90 per cent. of the load upon the vertical wheels running on the rail.

The entire equipment with loaded train will clear four and one-half feet vertical height, and since traction does not depend upon dead weight but rather on the pull of the train, we can overcome grades of 600 and 700 feet per mile or more if desired.

This system is intended to be installed as a feeder to the steam road and will make it practicable to open mining districts now unworked, because of lack of transportation. The road can be operated in districts where the snow fall would prohibit the use of a standard railroad, as it can be protected by a snow shed of simple construction not exceeding eight feet high.

The cars have a capacity of eight tons and the balancing wheels have an eight-inch face, and since 90 per cent. of the load falls on the rail carried on a longitudinal sleeper or cross-ties, the duty put upon the balancing wheels is small; and when we consider that the ordinary freight wagon carries its load on from two and one-half to three-inch tires, it will be apparent that the balancing wheels with eight-inch tires will cause little wear on the natural ground. The spring working with the balancing wheels permit of their travel over an irregular surface without affecting the equilibrium of the car.

The power may be either steam or electricity. The motors for the Wyoming and Southwestern Railway will be electric, with two 50 H. P. motors giving a draw bar pull of five thousand pounds.

Electricity Will Perform An Important Part in the Tabulating Work of the Next Census.

Although it is yet more than two years in advance of the beginning of actual enumeration, preparations are already under way for the next national census of the United States, that of 1910.

With a new policy of forehandedness the officials of the bureau of the census have not waited for the congressional appropriation, but are already busy with the administrative details of the coming census, and, even more important, the mechanical experts of the census bureau have been gradually evolving a number of wonderful new machines which will enable the compiling of the census returns more quickly and more accurately than has ever heretofore been possible. These early preliminaries have been rendered possible by the creation of the permanent census bureau which came into existence after the last national census, that of 1900. In days gone by, each successive census was an independent enterprise, with all the disadvantages that might be expected to result from entrusting a gigantic task to officials not familiar with the work and employes wholly or partly inexperienced. To remedy these defects Congress in 1902 established the bureau of the census as a permanent government institution.

The forthcoming federal census will entail upon the nation an expense of about $14,000,000. Of this total about $1,500,000 is needed for the maintenance of the permanent census bureau mentioned, whereas $12,500,000 represents the anticipated outlay for the canvass of the country's population. In addition to this, S. N. D. North, the director of the census, will ask Congress at its coming session to appropriate the sum of $675,000 to purchase a site and erect a six-story building as a permanent home for the census institution.

Mechanical mathematicians of one kind or another have been in use in the United States census office since 1870, but the system of electric tabulation which will be employed for the thirteenth census will be so far in advance of all predecessors in the matter of the machinery utilized as to mark a new era. Under this plan the census will be compiled on the card index system with a card for every man, woman and child in the country. However, it will be different from the card index system found in the average office, in that instead of data being copied on the cards by means of penmanship or typewriting, the information will be recorded by punching holes in the cards. The position of the holes on each card will carry significance as indicating facts relative to the individual whose biography the card holds. No writing whatever will be necessary on any of the cards.

The use of this short cut in census taking requires the use of two main classes of machines. First, there are the machines that punch the holes in the cards as described, and, secondly, there are the tabulating machines that take these cards after they have been punched full of holes and solely by mechanical means add and classify and make up totals from the cards. The style of card punching machine heretofore in use at the census is a rather simple affair in which the pressure of a lever by hand power is necessary for the punching of each individual hole. It has not been all that could be desired in speed, it is easy to make a mistake and spoil the card being punched, and finally its operation is very fatiguing to the young women who do nothing else all day long.

However, it was no easy matter to find a substitute for this machine that would constitute an improvement. James Powers, the mechanical expert of the United States census, has been puzzling his brain over this problem for years past and only within the past few weeks has he finally triumphed and perfected the invention of a marvelous new card punching machine. The new machine is built on the plan of a typewriter with two hundred and forty keys, and the mere depressing of any desired keys and the switching on of an electric current serve to punch the holes as needed. Heretofore the most expert operator, using the old hand machine, could not punch more than nine hundred cards per day. With the new machine any of the young women at the census bureau can punch from 3,500 to 4,000 cards per day. Moreover, with the old machine, a first-class operator would usually spoil at least one-tenth of the cards handled. With the new machine not one card in a hundred is spoiled.

Possibly the most interesting fact in connection with the invention of this new machine is that it will enable the announcement of the total population of the country in record breaking time. This is possible of accomplishment because in the new machine automatic counters are attached to the keys, registering on a dial every time a hole is punched. Thus, just as soon as there have been punched the eighty odd or ninety million cards, representing the people of the United States, the census bureau will be enabled to announce the eagerly awaited totals as to the different classes of our population—males, females, native, foreign, white, colored, married and single.

The next census will also see the introduction of a new style tabulating machine that marks almost as long a step forward as does the card punching machine. In the new tabulator, as in the one in use at the last census, the work is performed by a pin box, equipped with a needle for each possible hole in a card. Each of these needles is set on a fine spiral spring and when the pin box is brought down over each card in turn the needles which meet the unpunched surfaces are repressed, while those which pass through the holes make an electric contact and cause one or more counters or dials to register. In the old style machine the counters had to be read and the results recorded by hand, a proceeding productive of many errors, and then all the dials had to be reset by hand, a time-consuming operation.—Walden Fawcett, in Office Appliances.

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Technical Contributions

AN ODD BRAKE-VALVE DEFECT

BY WILL W. WOOD

There's a number of us engineers who realized years ago that the air brake was a "growing thing" that would become more highly developed and complicated as the years rolled by, and that no man would be considered an expert locomotive engineer unless he was particularly proficent in the understanding and practical operation of the air brake; and the whole bunch of us have made good in that line—in a general way. In fact, some of us are so darn well posted that we think we know more than our air-brake instructor, when it is largely through his patient, untiring interest in those of us who have continued as post-graduates, that we are able to claim any special distinction as "high brows" in the "pneumatic system of train-speed control,"—or, to use the shorter and uglier words,—*air brakes.* (I get most of my peculiar language from close association with "Highpockets" McGinniss.)

The air-brake instructor of the *Central* was in the air car one day while our instructor was putting McGinniss next to the very last thought in connection with high-speed passenger train braking when the cars are all equipped with the Type L triple valves, with their special high-speed features cut in—a condition that hasn't yet developed on the *Air Line;* and afterward I heard the *Central* man tell our instructor that he oughtn't to—wasn't expected to—go so deep in giving those fellows air-brake information: 'Why, they'll know—or think they know—more than you do," he said; but our instructor quoted in reply: "'He is the best teacher whose pupils quickest outrun him.'

"And say, brother," he went on, "competition is the very life of everything; competition of wits makes sharp minds. I am doing my best to make every engineer on the *Air Line* able to qualify as an air-brake expert, and *I* am going to run as the First Section—not by putting stumbling blocks in the way of others, but by getting my orders first and then turning my wheels just a little faster than the other fellows can; and with several years the start, if I can't retain the position of IT in this game—why, then it will be a recurrence of the nonsurvival of the unfittest." And that's just what he said.

I'm not saying much in the presence of others at the present time. My reputation as a pretty fair engine-runner has been based largely on good air-braking, but now, as an air-brake operationist I'm a "*has been*"—wrecked on the bumping post of an idea that I was too big an "*is-er*" on air; in other words, I thought I knew more than the instructor, and—I *got mine,* all right; got shook down by *Air Line* officialdom harder than I shook up the passengers on the—but wait till I get started right, and I'll tell you all about it.

My regular engine—ET equipped—that I run on the through passenger trains is in the back shop. When she went in, another engine—the 143—came out of the shop, and was placed on an accommodation, three-car passenger train, and as there was a shortage of engineers just then, I broke her in, and was temporarily assigned to that run.

This engine has the ordinary automatic air-brake equipment, with G-6 brake valve, and the day I run her around the yards to limber her up I noticed that the brake valve worked queerly—as to results; the brake seemed to set mighty powerful at light applications; but me being just off an ET-equipped engine, I didn't pay much attention to that. The funny part was that after putting the brake valve in release position, when I drew the handle back to running position there would be several quick flashes of air from the brake-pipe discharge fitting, accompanied by a rapid drop of the black gauge-hand a distance of six or eight pounds—or something like that—and the driver and tender brakes would reapply lightly, but would release again almost immediately.

It appeared to me that this thing couldn't be caused by anything else than a leak from chamber *D* or the equalizing reservoir; but everything in connection with that brake valve was apparently tight; no leaks whatever. When I brought the engine back to the roundhouse tracks I took the brake valve apart and examined everything carefully before putting it together again, and all seemed well; every port in the rotary valve and seat was clean, gaskets in good condition, and the equalizing piston worked freely. Me! I understand the air? In this case I was surely up against it; didn't know how to "make an intelligent work-report of an air-brake defect," which is the accomplishment that the instructor has been trying to educate us up to for these many years.

I hiked up to the air car and told him all about it. He was going away on No. 6, however, and didn't have time to go down and personally inspect the brake valve, but after studying the case for a few minutes he said: "You have overlooked something. In running position the connection between chamber *D* and the brake pipe, in this brake valve, is nearly closed. Are you sure that the equalizing port in the rotary-valve seat is not stopped up—or nearly so—restricted in some manner?" And I told him *yes;* nothing doing in that direction.

He made me sore, a little. "You are mistaken," he replied, "and you will find that I am right. Take that brake valve apart again, and look into it closely and carefully, inspecting the ports in the rotary valve and seat in particular, for if you are going out on the milk train in the morning you won't want the brake valve to be working the way that you describe. You might get the assistance of the air-brake inspector, but he is short of experience, and don't depend on him alone. Depend upon yourself; no one around here is better posted on the air than you, and you'll find the trouble just where I have told you. So-long," and he was gone.

Now, what d'you know about that? I perceived that *he* didn't know *his business*, and he thought I didn't know what I was talking about. But I went down and did it all over again, just as he advised me to, and the inspector saw everything was just as it should be. So I booked a report, stating the brake valve *worked irregularly*—a kind of work report I had never made before, and had criticised others for making, as I always try to be definite—and left the matter with the roundhouse people. But as I reported nothing specific, and the roundhouse inspector couldn't find anything wrong; and the air-brake repair man in the back shop insinuated that the trouble was "an arm-length *from* the brake valve," they let her go without further examination, and claimed that the brake valve was all right.

I got the engine and train at the station in the morning. When I set the air for the car inspector's test I expected to make a 10 or 15-pound reduction, but before I could lap the brake valve the black gauge-hand had fallen to the 30-pound mark; there was an unusually strong brake-pipe discharge for a three-car train, but which suddenly closed, and then opened again more lightly, blowing until the pressure was down to an equalization with the black gauge-hand. And when I released the brake, just after pulling the handle back to running position the equalizing piston raised and gave about a three- or four-seconds discharge of brake-pipe air.

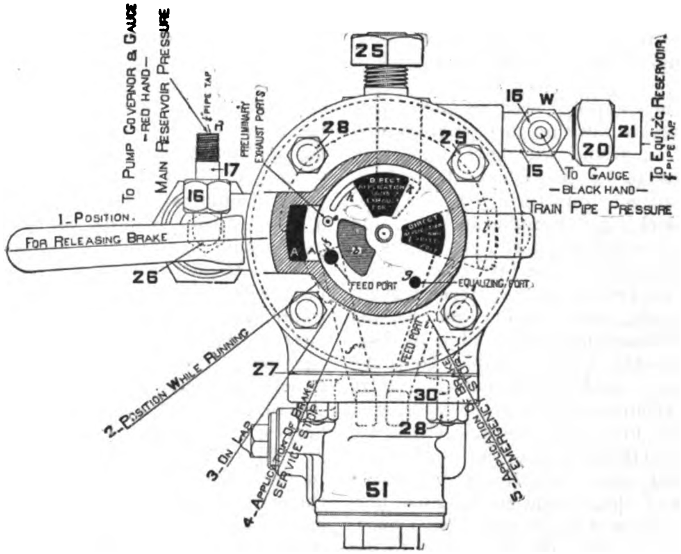
Too late, then, to change brake valves, and I decided to fight it out with that one rather than delay the train in getting another engine, but I was feeling mighty uncomfortable; and just then the division superintendent and the general passenger agent walked up to the engine, and after a pleasant "Good morning," I was informed that they were going up to Columbia on the milk train; that everyone was speaking of my remarkable handling of the air brakes in passenger service (they are yet—in a way), and a lot of such hot air—well meant, but sandpaper to my soul.

Oh, well—I won't talk about it, and I hate to write about it. What I did to the Div. Supt. and the G. P. A., and a lot of innocent men, women and children is history now. But in anticipation of what was coming to me, every time I set the brake during that trip I would say—"Here's thanking you in advance," and then the train brakes would flop on at emergency action.

When it was all over but the inquest, and we pulled into Columbia, I tried to explain to the two officials that the rough operation of the brakes was due to defective mechanism; but as they put it back to me, I should not have started out with defective apparatus, and it was apparent to them that the trouble was in existence from the very beginning of the trip. And they told me that I must either have the defect remedied or they would demand another engine *or engineer* for the return trip. I didn't have enough ginger left in me to even stick out my tongue at them.

I didn't know what to do. It's a good lesson to teach engineers to keep themselves so well posted on the air that they will understand the cause of troubles in that line and know what to report—there will always be somebody to do the work *if you tell them squarely just what it is.*

I went down to the roundhouse with the engine, and glory-be! I found the air-brake instructor there. When I had given him the harrowing details of the trip he went around to the engine with me and we opened up the brake valve again; when the rotary valve was removed and the seat exposed, the instructor gazed steadily at the rotary-valve seat for some time, and then he laughed loudly—with untimely mirth, considering the state of my feelings—and he pointed his finger at the brake valve and then at me until I got sore—and then interested enough to catch on to the dad-burned thing that had caused all of the trouble, without him saying a word—just pointing at it. And say—that was the last straw; the last bit of self-conceit oozed out of yours truly, and I realized that probably the best man in the world will occasionally overlook his hand. But in explaining it I had better start from the beginning.



Westinghouse G-6 Brake Valve, top view, showing Rotary Valve Seat with the Rotary Valve removed

A month or so beforehand, the old wooden roundhouse at Southport burned down and there were a couple of cold engines that they couldn't get out. One of them had a bran-new G-6 brake valve, and when the burnt engine was brought to the back shop the air-brake machinist removed it and gave it a thorough overhauling, after which it was placed on engine No. 143, which was about ready to come out of the shop. The air-brake man that did the work on that brake valve wasn't as thoroughly conversant with that part of the Westinghouse equipment as he should have been—came from a road where they use the New York air—but, there I go; goodness knows, I haven't got anything on him.

The plate shows a top view of the G-6 brake valve with upper part of valve body cut away on the plane of the rotary-valve seat, and with rotary valve removed. Referring thereto, port *e*, and port *g*, in the seat were drilled the same size—a quarter of an inch in diameter—but, a short brass bush is forced into port *e*, and a 5-64-inch hole that is drilled through it is called the *preliminary-exhaust port.* Port *g* is the *equalizing port.*

This brake valve got so hot when the roundhouse burned that the bush in port *c* became loosened; the air-brake repair man drew it out, and spread it to secure a forcing fit, but—he *forced it back into the equalizing port, g.* The bush had spread inward as well as outward, too, and not having run the drill through it afterward, the "equalizing port" was thereby reduced to a little less than 1-16 inch in diameter; while the *preliminary exhaust port, e,* was increased to ¼ inch.

An oversight. And on my part, too, for I inspected the rotary-valve seat closely and the ports all looked natural. If that bush had been missing, I would have noticed its absence quickly enough, but that it would be displaced—why, who would ever be looking for such a thing?

Old-time engineers used to have to do a lot of repair work on their engines, and they did a whole lot more that they didn't have to do. Nowadays, all you have to do is to get your train over the road on time and without undue incident, and report your work when you get in, and—*maybe*—it will be done for you; but let me tell you, brothers, an engineer has got to be a mighty keen person, and one who studies continuously, to be able to diagnose correctly every trouble that develops on a modern locomotive; or to get the reputation for never making a mistake in his work report. There are such men (there is one less than there was); but about the time a fellow begins to wish they would get up some new kind of a locomotive, so's he'd have something new to study on—he is due to *get his*, good and a-plenty.

But it's odd, the effect extreme heat has on brass-bushed, iron-bodied valves. When constructed, the bushings are forced into place under such pressure that their facing surfaces can be machined in place without slipping; but after the expansion of the two metals from fire, their amount of shrinkage seems to differ, the diameter of the bushings having become so reduced that they quite often fall out when the valve is taken apart. A triple valve that has been overheated has to have all bushings renewed.

If care is not taken in reapplying second-hand air-brake parts danger may result on account of those partly loosened bushings, and very particular tests should always be made. We had one slight accident—that might have been a worse one—happen through the use of an angle cock that had been on a freight car that was burned. After putting it on another car it seems to have worked all right for a time; but finally, when the handle was turned to open the angle cock the cock-key stuck to the bush and both turned; of course, the ports in the bush and cock-key were not in register with each other, and the angle cock remained closed in any position of the handle; and the result was that the engineer only had six air-braked cars under his control in a train of 50, and failed to get stopped quick enough at a meeting point; with a case of side-swiping the other train, that wasn't in to clear the main line.

Well, to conclude with a return to the *confessions of an engineer*, I got the roundhouse machinist at Columbia to change that little bush again, from the equalizing port to the preliminary-exhaust port where it belonged, and on the return trip the brake valve and the train brakes worked all right. But there was an official investigation a few days later in the office of the S. M. P., and while the air-brake machinist who did the work on the brake valve got what was coming to him, I was relieved from further service until my regular engine should come out of the back shop. I didn't mind resting up for a couple of weeks; nor I didn't so much mind the sarcastic, one-sided conversation that I was compelled to be a party to, but—getting a lemon because I *didn't know what was the matter* with my air, when the defect would have been apparent to a blind man—who was as familiar with the G-6 brake valve as I should have been—that's what hurt.

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ELECTRICAL RAILROADING

BY ELWOOD GRISSINGER

Brush holders and commutators will sometimes show excessive temperatures because of the heat which may come from a bearing in which the armature shaft revolves. The failure of a bearing upon a dynamo or a motor to run cool may be due to any one of a great variety of causes, some of which are mechanical and others electrical.

A common cause, and one which is not infrequently overlooked is that of lack of sufficient oil in the bearing for the purposes of lubrication. When renewing the supply of oil to a bearing care should be exercised in the choice of oil, making certain that it is free from dirt or grit and that it is an oil of good quality for the purpose in hand. The passages or oil ducts should be carefully examined and kept perfectly clear for the free running of the lubricant. A bearing may be leaking at some point, causing the oil to run off much sooner than an attendant would think, and this kind of a defect should be carefully guarded against.

The modern dynamos and motors have their bearings so designed that they are self-oiling, i. e., the oil is carried by means of chains or rings from the oil chamber beneath the bearing proper, up and over the shaft and through grooves provided for the purpose, returning to the well to be used over and over again. Gauge glasses are nearly always provided by means of which it is possible to observe at any and all times the quantity of oil remaining in the well. Oil used over and over again in this manner is quite likely to gather foreign impurities. It is good practice to remove the oil from bearings at least once a month, clean out the bearing thoroughly with gasoline, filter carefully the oil that is left and return the same to the bearing, adding a sufficient quantity of fresh oil to make up for any loss which has been the result of operation.

The same ruling can be well applied to street railway motors. Here, however, the use of a light oil is generally coupled with a heavy grease which tends to liquefy as the bearing warms up in service.

Gritty substances are very likely to work into bearings at different times, depending upon the use which is made of a motor or a generator. If electrical apparatus is to be placed in a space that is dirty and cannot well be kept clean, then it is a good precaution to have the machine suitably enclosed, or else to have the bearings completely enclosed with tight-fitting plates about the shaft so as to exclude foreign substances. Whenever it is found necessary to wash out a bearing in order to remove any dirt, care should be exercised not to get any water or kerosene upon the commutator or windings of the machine.

A roughened shaft or a tight fit between the shaft and the sleeve of the bearing may cause heating. These difficulties are purely mechanical and are easily remedied once that the source of the trouble is ascertained.

Sudden and excessive strains sometimes spring the shaft of a generator or a motor, and it not infrequently happens that with some types of bearings they are thrown out of line. Either of these causes will bring about a heating of the bearing. A bent or crooked shaft can rarely ever be straightened, the only remedy being a new one. Bearings that can be thrown out of line for the reasons mentioned are also susceptible of being properly aligned by means of the caps and screws for holding them in position.

The end thrust of a collar on the armature shaft, upon one side or the other of the machine, may cause a heated bearing. When machines are driven by belting or when motors are connected with shafting by belting, it is an easy matter to ascertain whether the armature is running freely with respect to the belt connection. A stick placed against the end of the shaft would enable one to move the armature back and forth with very little effort. In fact, every armature should have free end play, and if a test with a stick as mentioned does not show that such a free end play does exist, then the machine should be lined up with respect to its belt, so that such end play is secured.

A motor may be so set that the distance of pulley centers will be too short, thus requiring an abnormal tension on the belt to transmit the requisite amount of power. A wrong proportion of pulley diameters as between the driving and the driven pulley will tend to make the belt slip when transmitting the power load, thereby necessitating an increased belt tension in order to decrease the belt slippage. Such increased belt tension is to be avoided in every instance, as it is always hard upon the bearings, bringing about an entirely unnecessary strain easily avoided.

Some types of motors and generators are so built up electrically that unless the armature is accurately centered in the field in which it revolves, there will be an unequal strain placed upon the shaft by virtue of the armature being nearer one set of field poles than those diametrically opposite. The result is that there is a greater magnetic pull upon one side of the armature than upon the other. This defect will very likely cause heating of the bearings when the machine is operating under a load. The greater the load, the greater will be the magnetic pull and the greater the inequality of magnetic pull when the armature is out of center. In the larger types of machines, and in many of the smaller ones, this defect is not in evidence for the reason that they are so designed that it is immaterial whether the armature is out of center or not—the operation of the machine is not impaired. It is brought to attention here, however, for the reason that a case may arise at some time or another where it will be useful to know that such a condition can exist and it might, therefore, not be unexpected.

An examination of the clearance between the faces of the field magnets and the surface of the armature may reveal an inequality. If, however, it cannot be detected in this manner, then it might be possible to determine if this defect is present by opening and closing the field circuit with the brushes removed from the machine, when the armature may be noticeably drawn to one side more than the other, and also that the armature may turn very much less easily when the field is magnetized. If the armature is centrally located in the field the magnetic pull will be equal upon all sides, with the result that the armature will turn easily in any direction.

Another indication of an armature out of center in the case of multipolar direct-current machines is that of sparking at the brushes already referred to. Sparking, which might be caused by an armature being out of center, does not occur in machines other than the multipolar direct-current type with multiple circuit windings. The heating of the bearings may take place in two-pole machines, but it is likely to be much more aggravated in multipolar types. The air gap in multipolar machines is, on this account, always made somewhat greater than in other forms of dynamos and motors.

A heated bearing may also be due to other causes than those within the bearing itself. The heating of the commutator and brush holder parts may be carried into the bearing adjacent to the commutator. Therefore, in looking for the seat of the trouble, it is well to be certain that the heat does not come from some source outside of the bearing proper.

The noisy operation of generators or motors is usually very objectionable on account of its regularity and continuity. Noisy operation can generally be connected with some one fault or another, and therefore the cause should be removed before the machine is damaged as the result of the fault. Sometimes, one or the other of the parts constituting the machine may work loose and begin to rattle. This should be immediately investigated and the loosened part fitted up tightly with the means afforded for the purpose. There are not supposed to be any parts upon a motor or a generator that are not firmly fastened, and inasmuch as such pieces of machinery are usually run at a comparatively high rate of speed, it is very important that all of the parts shall be positively held in place.

The flapping or pounding of a belt because of an imperfect joint may be the means of loosening other parts of the equipment, and such a defect in operation should not be permitted to continue. The proper joint in belts when used in connection with any electrical apparatus is a cemented joint. Laced or riveted belts should never be used.

The armatures of all dynamos and motors are supposed to be in perfect running balance when they leave the shops. This balancing is effected by means of various types of shop equipment, sometimes balanced in the old table method by hand, and sometimes given a running balance. The small weight placed upon the body of the armature to place the same in running balance may work loose in shipment or after having been in operation for some time. The apparatus may even be received without having been put in proper running balance, particularly so in the case of the smaller high-speed machines. The lack of balance will evidence itself in the vibration of the entire machine upon its foundation, the degree of vibration depending upon the speed of revolutions of the armature and the extent to which the revolving member of the machine may be out of balance. When this condition evidences itself, it is advisable to remove the armature and put it in good balance. If the facilities are not at hand for the work, then the armature should be returned to the shop from whence it came and the defect properly remedied.

The bearings may wear down sufficiently in time to permit of the armature bands rubbing against the pole pieces or stationary iron of the machine. This can often be detected by placing the ear near the frame of the machine opposite the pole piece where it is thought that the armature might come in contact. It might also be detected by turning the armature over slowly with the belt removed and with the field current turned on. It might also happen, however, that the armature will not touch any of the field poles, except when running under load with the belt on. The positive evidence of rubbing lies in an examination of the circumference of the armature itself when the bands around the armature will show whether there has been any rubbing or not. This kind of an examination can usually be made without removing the armature from the machine. If there should be positive evidences of rubbing, it must not be allowed to continue.

The pulley, the belt or other parts of the revolving armature shaft may rub against adjacent surfaces and bring about a scraping or a rattling noise. The movement of the shaft back and forth in its bearings in one direction or another may stop the noise, in which case it will be a simple matter to locate the cause, after which it will be an equally simple matter to remedy the trouble.

Generally, in starting up a new generator or motor, the new and unused carbon brushes upon a new and previously unused commutator will cause an unpleasant squeaking or a hissing. The sound is usually of a high pitch and is easily located. Sometimes, it may be due to but one or two new brushes. These can be located by removing one brush at a time until the noisy ones are found. Then by moistening them slightly with a light oil, the noise from that particular brush will be stopped. There should not, however, be so much oil used for this purpose so that any of it will adhere to the brush in the form of drops. It sometimes happens that the armature has not had the commutator finished off as smoothly as it should have been made and this, of course, would cause a considerable humming until the commutator surface had been worn over sufficiently to take on a polished appearance. If the commutator is rough enough to cause a hissing of the brushes, it should be polished off by hand before it is put into operation. This can be done in the manner already described and would insure a much better commutator in service than if allowed to run along in the rough state, trusting to luck that it will assume a polished appearance as a result of operating conditions alone.

A squeak due to the slipping of a belt upon the pulley is easily located and not confounded with any other noise which may result from operating any class of machinery. Whenever such slipping of a belt occurs, it means a loss of power, and that means expensive operation. A care for the details of operating costs will not permit of a squeaking belt at any point.

Another kind of humming is often present in motors and in some kinds of generators. This is the humming which is something of a musical sound and is likely to be confined to the armature teeth as they pass the pole faces at high speed. It is a molecular vibration due to the magnetic reversals in the iron. If it is an objectionable feature in the operation, it may be remedied by trimming off the ends of the pole faces so that the full length of an armature tooth would not be likely to leave the pole face throughout its entire length at the same instant of time, but would shade off instead. The testing of generators and motors in the shops of the builders, however, is supposed to reveal excessive humming, and the trimming of pole faces should be done before the machine is sent to the shipping room. In general, it is always well to be certain that the noises of operation come from the electrical apparatus and not from some other equipment which might be close by.

Whenever the speed of a generator or a motor is much higher or much lower than the known normal speed of the machine, it is almost imperative to immediately bring the apparatus to rest and ascertain the cause of the change in speed. If the engine driving a generator slows down perceptibly, then it is possible that the equipment is overloaded. A reduction in the driving speed of a generator when operating under a heavy load may damage the machine considerably. If the generator must be run for short periods of time under abnormal conditions, then it should be run at a higher rate of speed, but never at a reduced speed.

Low speed in a generator or a motor may be caused by short-circuited or grounded coils in the armature, an explanation of which will be found in a preceding paper. The armature rubbing against the pole pieces, or the armature shaft not revolving freely in the bearings may be contributing causes.

The speed may be either too high or too low in the case of series-wound or of shunt-wound direct-current motors, because of weakness in the field magnetization. If lightly loaded, motors of either type will run too fast if the field magnetism is weaker than normal, other conditions remaining the same. If heavily loaded, the same motors would run too slowly. If the variation in speed is traceable to a weak field, the remedy for the trouble is as already pointed out for the different conditions likely to be found associated with the magnetic field. A variation in the E. M. F. of the line supplying the motor with current will bring about variations in speed sufficient to make a careful study of the conditions absolutely necessary. Any difficulty of operation from this source, however, is easily corrected by seeing to it that the proper E. M. F. is available for the purpose in hand.

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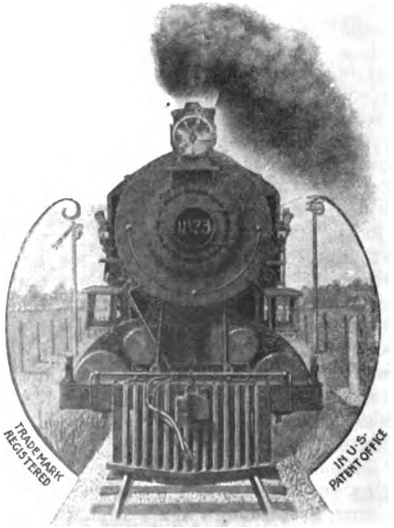

MOVEMENT OF TRAINS

BY G. E. COLLINGWOOD

Recent Rulings of Importance.

The American Railway Association has recently handed down some rulings in connection with train movement which the readers of this department will appreciate.

Under the rules providing that signals shall be displayed one on each side of the rear of every train as markers to indicate the rear of the train, is it proper or not to display markers on both the caboose and the helper of trains to which helpers are attached to the rear? The committee stated that to answer the question specifically depends upon what the helper is. If the helper is running as an extra train, then both the train which it is assisting as well as the helper must display markers and also class signals. If, however, the helper is without train orders and couples in as a part of the train which it is helping, then the markers must be displayed upon the helper and not upon the caboose of the train which it is assisting. Markers displayed upon the helper and upon the caboose would indicate that there were two independent trains closed up. Such a ruling as this is of great importance to trainmen in the proper handling of a train, and as usual the ruling is not only a safe one, but it is strictly in accordance with the rules.

The question was also asked the committee as to whether a train arriving at a point where, say, one hour dead time is shown, 11 hours and 55 minutes late on its schedule arriving time, can leave any time within twelve hours of its leaving time? The committee replied that it could. A train arriving at a station less than twelve hours late on its schedule arriving time does not lose its right. It has fulfilled that part of its schedule, after which the leaving time only at that station need be taken into consideration, and if such train can depart within any time less than twelve hours late on its leaving time it has, under Rule 82, the right to proceed. Should a train at any point fail to make its schedule within the twelve-hour limit it cannot thereafter resume its schedule without a train order to do so, even though it overtakes it.

Standard Code Rule 214 provides that when a train order has been repeated or "X" response sent, and before "complete" has been given, the order must be treated as a holding order for the train addressed, but must not be otherwise acted on until "complete" has been given. Should the wire fail, this rule has the effect of holding the train addressed indefinitely; it may be that the order which the train is waiting for "complete" to is a wait order and that the time has expired or almost expired, the result is the same and the train addressed must wait until the line is restored so that "complete" can be given to the order. In view of these facts a certain railroad company has submitted to the committee a rule which will allow a train to act upon an order before complete is given, when the line fails. The rule proposed reads as follows: "If the line fails after an office has repeated an order for which 'OK' and the acknowledgment has been given and the despatcher cannot be reached to give 'complete' to same, the operator will complete and deliver the order in the usual manner, writing after the word 'complete' 'as per rule 210 (a)' and permit the train to proceed. The operator will notify the despatcher of his action as soon as communication is restored. The conductor and engineman will advise the despatcher from the first open telegraph office from which he can be reached."

The committee made reply to this railroad company in the following words: "The committee does not approve of the proposed rule nor does it think it wise to make any change in the method of handling the 31 order. If greater freedom is desired, Rule 211 provides for the use of the 19 order and will avoid the suggested difficulty." By using the 19 order as suggested by the committee, they would overcome the delay to trains resulting from wire failure, but not all railroad managements care to adopt the 19 order to restrict a superior train, on account of the greater risk run with a 19 order than with a 31 order. The greater element of danger lies in the fact that the order is delivered to the train while in motion and while the rules require that if the engineman or conductor fail to get a copy the train must be stopped, still there are a number of instances on record where the engineman has missed the order and kept going because he thought the conductor had a copy of the order, and the conductor in turn missed it and depended on the engineman having a copy; of course such action is not in accordance with the rules, but the temptation seems to be great. Another danger is that the operator will fail to deliver all the orders he has for the train; this danger could be overcome by requiring the operator to check the numbers of the orders to be delivered with the train despatcher before delivery, and providing a clearance card which mentions each order delivered by number, but the rules covering the handling of a 19 order at present do not afford this protection.

Rule 93 provides that within yard limits the main track may be used by protecting against certain class trains and trains of the class specified must move within yard limits prepared to stop, unless the main track is seen or known to be clear. With the cost of operating expenses high and delays to switching service expensive, in mind, a certain railroad company asks what would be a proper interpretation of the word "protecting" which is used in the rule. Would it be necessary to protect against the trains mentioned as per Rule 99? The answer received was as follows: "The committee on train rules does not attempt to give in detail the manner in which protection is to be secured, conditions and practices varying on different roads. Railroads equipped with automatic block signals may wish to take advantage thereof; some roads operate under manual protection; other roads equip themselves with semaphores on each side of the yard, which are held at stop at all times except when trains are to be allowed to pass or come in; some railroads have rules requiring all second class and inferior trains to approach and pass through yards under control. The manner in which protection may be given is left to each road to determine for itself."

A great many railroads, in their instructions governing the movements of trains in yard limits, state that trains must be under "full control." We are often asked what the term "full control" means. The generally accepted meaning is that a train must move at such a speed that it is prepared to stop within the range of vision of the engineer—in other words, to not go faster with the train than a speed at which it could stop short of a dangerous point or short of an obstruction should the necessity arise. To "proceed with caution" seems to mean about the same as "full control." The words "full control" do not appear in the Standard Code, but the term "proceed with caution" is employed, and the exact method or manner of application is left to each road to determine for itself. It is quite probable that no definite definition can be given to this term without making it of such severity as would result in unnecessary delay to trains. It seems best to let the present understanding remain as it is, and enginemen use their best judgment as to what is a safe speed to move at, under conditions in which the rules require that they proceed with caution.

Another railroad company asked the committee if a train running extra A to B has the right to go down the main track at B to the telegraph office, which is located at the extreme end of the passing siding, provided there is no superior train due to compel it to take siding, or do the standard rules require that it head in at the first switch? The committee answered as follows: "The answer to this question is found in Rules 89 and 90 of the Standard Code of train rules. The extra train expires at B, and must head into the siding and clear the main track at B. If for any reason it is necessary for the extra to occupy the main track for purposes of pulling down to the extreme end of the siding or for any other reason it can do so only under protection."

We are pleased to note that the answers given by the Train Rules Committee of the American Railway Association are all in strict accordance and harmonize with the answers to similar questions which have been asked through this department from time to time. With the advent of the revised rules there is no longer much chance for disagreement in regard to the correct interpretation of any rule or combination of rules or orders. There is a chance, however, to improve the wording of certain rules, notably Rule 4 and Rule 94, which do not state at all clearly the procedure which is expected to be taken under them, and as many roads are adopting these two rules in their present form, questions of procedure under them are coming in rapidly. In view of these conditions we shall in a future issue explain these two rules in detail, showing the wording which is misleading in each, and also giving the interpretation which the committee intended to convey to trainmen through the words used.

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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

793. **Counter Bore of Cylinders.**—"Why are the ends of the cylinders counter bored?" —*J. L.*

Answer.—The snap rings forming the cylinder packing are always made larger than the bore of the cylinder, consequently if the cylinders were not counter bored considerable difficulty would be experienced in getting them into the cylinder. For this reason the cylinders are counter bored with a beveled shoulder on the inner side of the counter bore, the beveled shoulder acting as a wedge when the snap rings on the piston head are forced against it, thus closing the rings all around and admitting of their easy passage into the cylinder.

794. **Action of Bourdon Tube in Steam Gauge.**—"Why does the steam pressure tend to straighten the tube springs in the steam gauge?"—*J. L.*

Answer.—The tube in the steam gauge has a tendency to straighten out as the lines of force or pressure always act in straight lines, and as the lower end of the tube where the lines of force originate is rigidly fastened and the upper end of the tube against which these lines of force act is not, it is free to move to a limited extent in response to the pressure acting within it. If the material of which the tube is composed was of a nature, such as rubber, where the force necessary to straighten it were less than the force necessary to burst it, the tube would become perfectly straight.

795. **Effect of Backset of Eccentric Blade Connection on Movement of Link.**—"How can the link pin holes from the link arc affect the working of the valve?"—*J. L.*

Answer.—The link pin holes or eccentric blade connections, being coupled to the link back of the true radius, virtually act on an arc of lesser radius than that of the link, consequently this introduces a slight error in the valve movement, as it has the effect of producing a slight up and down movement to the link, that is, the point on the link arc opposite the blade connection rises and falls in relation to the point of actual connection. The error in the valve movement is very small, however, and is almost overcome or counteracted by the location of the saddle pin.

796. **Headlight Carbons.**—"What is meant by carbons in the electric headlight, and what are they made of?"—*J. L.*

Answer.—By electric carbon is meant the round, pencil-like piece or object introduced or held in the carbon clutch immediately above and resting on the copper electrode. In fact, it is like a round rod, being about ⅝ inch in diameter and from 12 to 14 inches long. It is made of ordinary carbon, such as contained in coke, ground up and mixed with a suitable binder and then molded to the desired form in iron molds under high pressure. It is combustible the same as other forms of carbon, but requires a very high degree of heat to burn it. The exact composition of the headlight or arc light carbons in general use is unknown to the writer.

797. **Sensitive Part of Firebox.**—"After the flues and flue sheet, what is the next most sensitive part of the firebox?"—*J. L. D.*

Answer.—The side sheets usually. In some cases, however, where the form of construction is too rigid to permit of the usual expansion and contraction the door sheet often fails, due to cracking around the door hole.

798. **Source of Power.**—"What is the source of power in a locomotive?"—*J. L. D.*

Answer.—The source of all mechanical power is heat, which is simply a form of energy or motion. The energy or heat contained in the fuel is utilized in the locomotive by being imparted to the water in the boiler, generating steam, the steam being then admitted to the cylinders, where its energy or power is converted into motion.

799. Leaky Dry Pipe.—"How can you distinguish a leaky dry pipe from a leaky throttle valve?"—*J. L. D.*

Answer.—As the throttle valve is located at the highest point of the boiler, any leak that may come from it will naturally be dry steam unless the boiler is full of water to the top. The dry pipe, however, being at all times almost in contact with the water and in many cases partially submerged, will leak both water and steam; therefore, if the engine leaks dry steam it comes from the throttle, and if steam and water mixed it comes from the dry pipe. Be sure the lubricator is shut off, however, before reporting a leaky throttle, as the steam may be coming from the lubricator.

800. Blocking for Broken Spring.—"How would you block up for a broken driving spring, hanger or the equalizer on an eight-wheel engine?"—*J. L. D.*

Answer.—The method is practically the same for either breakdown. First, place a good solid block, preferably a piece of iron, between the top of the back driving box and the bottom of the frame, then run the back wheel up on a block or incline high enough to raise the frame off the front driving box. Now block up between the top of the front driving box and the frame, then run the back wheel off the block and run the front wheel up, remove the block placed over the back driving box, pry up the front end of the equalizer as high as you can, block it up with a piece of iron, old nuts, a journal brass or anything you have handy, run the forward wheels off the block and proceed. This will give you the full benefit of the back spring and leave but one wheel blocked up. This method will apply to front driving spring, spring hanger or front end of long equalizer; if the back end of the long equalizer is broken, however, the operation must be reversed.

801. Frictional Resistance.—"What part of a locomotive has the greater frictional resistance?"—*J. L. D.*

Answer.—It depends largely on the type of locomotive; as a rule, however, the greatest amount of frictional resistance when the engine is drifting is that due to the driving wheel journals and hubs. With an engine having unbalanced slide valves, however, and working steam the greatest frictional resistance to be overcome is that of the valves.

802. Broken Tire.—"How must I block up for a broken tire?"—*J. L. D.*

Answer.—This depends on the type of engine. As a rule, in case the tire comes off the wheel entirely, run the wheel up on a block or incline about twice the thickness of the tire, remove the collar and put a good, solid block of wood, as large as you can get in, between the journal and the pedestal or binder brace: at the same time put a block between the spring saddle and the frame or between the ends of the equalizers and the frame, in case engine has no spring saddle on top of the driving box, this to take as much weight as possible off that wheel, run wheel off of block and proceed. If it is an eight-wheel engine, however, and the back tire is broken and gone, it is necessary to chain across from the back corner of the engine frame where tire is missing to the opposite corner of the tank, so as to hold the flange of the other wheel against the rail.

803. A High-Pressure Locomotive.—"Is it a fact that there is under construction in the shops of the Reading Railroad a locomotive that will carry 325 pounds of steam, having boiler plate one inch thick? Can you furnish dimensions?"—*C. D.*

Answer.—This is simply a "pipe dream" originating in the fertile brain of some reporter. The editors of Railway and Locomotive Engineering noticed the same item, and upon writing Mr. H. D. Taylor, superintendent of motive power and equipment, in regard to the matter received the reply which we quote as published in the columns of the above mentioned journal:

"I am surprised that you would give any credence whatever to comments you may find in newspapers. We have passenger engines carrying as high as 240 pounds pressure, but we do not intend in the future to build anything carrying over 180 pounds, as we have found from practical experience that the cost of maintaining such boilers is beyond any gain to be derived from the high pressure."

You will note that the experience of Mr. Taylor coincides with the conclusions arrived at by Prof. W. F. M. Goss as stated in an answer to a question in regard to high boiler pressures in a previous issue of the Magazine.

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804. Hot Water Pressure.—"Can you say where and when the first hot water washout and filling system was put in service?"—*C. D.*

Answer.—We cannot, but judging from the fact that the use of hot water for washing and filling boilers is mentioned in The Engineer, published in London, England, as far back as 1861, its advantages have been long known.

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805. Horsepower Necessary to Haul Train.—"How many horespower would it require to haul a train of 400 tons up a 3.6 per cent. grade at 20 miles per hour? How many horsepower for train resistance? How many horsepower for grade resistance? Independent of internal friction of engine. Please figure this out."—*C. D.*

Answer.—In this problem it is first necessary to find how many pounds of tractive power are necessary to haul the given load up the given grade at 20 miles per hour, as all resistances are based on pounds tractive power, and then convert the result so found into horsepower. The accepted resistance due to friction of the cars or train is 6 pounds per ton. That due to grade is 20 pounds for each per cent. of grade; there is a difference of opinion as to the resistance due to speed, D. K. Clark using a formula which would give 9 pounds at 20 miles per hour, the Engineering News one which gives 7 pounds and the Baldwin Locomotive Company one which gives 6½ pounds. We will split the difference between the high and low and use the Engineering News formula, which is $R = 2 + \frac{V}{4}$, in which R = resistance, V = velocity. As nothing is said about curves we assume the track is straight. We then have the amount of pounds tractive power necessary to haul one ton of 2,000 pounds up a grade of 3.6 per cent. at 20 miles per hour =

Resistance due to friction = 6 pounds
" " grade $= 3.6\% \times 20 = 72$ "
" " speed $2 + \frac{20}{4} =$ 7 "

$6 + 72 + 7 = 85$ pounds total resistance of one ton.

Resistance to be overcome, or pounds tractive power necessary to haul 400 tons up the same grade at the same speed, would equal 85 pounds $\times 400 = 34,000$ pounds tractive power.

The formula for converting tractive power into horsepower is:

$$\text{H. P.} = \frac{\text{T. P.} \times \text{S.}}{375}$$

in which

H. P. = horsepower.
T. P. = tractive power.
S. = speed in miles per hour.

Substituting figures we have

$$\text{H. P.} = \frac{34,000 \times 20}{375} = 1813.33$$

To find the horsepower necessary to overcome the train resistance we have 6 pounds (resistance of one ton) × 400 tons = 2,400 lbs. tractive power necessary to overcome friction of 400 tons; then using the same formula for converting tractive power into horsepower as above we have

$$\frac{2,400 \text{ lbs.} \times 20 \text{ miles per hour}}{375} = 128 \text{ H. P.}$$

and by the same method the horsepower required for grade resistance would be

$$\frac{3.6 \text{ per cent} \times 20 \times 400 \times 20}{375} = 1536 \text{ H P.}$$

You must not from the above calculation, however, make the error of thinking that a locomotive developing 34,000 pounds of tractive power will haul a train of 400 tons up such a grade at twenty miles per hour, as in all cases of figuring or calculating the tonnage rating or capacity of a locomotive by the above method the weight of the engine must be included, so that in this case, assuming that the locomotive weighed 100 tons, the train could consist of but 300 tons, or if the train must consist of 400 tons it would be necessary to use a locomotive having as much more than 34,000 pounds tractive power as would be necessary to propel itself. There is another method of calculating the horsepower required to lift a train of 400 tons vertically a distance representing 3.6 per cent. of a mile at 20 miles per hour, the result being the same as the horsepower required to overcome grade resistance, viz., 1,536 horsepower. The following is the method: A horsepower is a power that will lift 33,000 pounds one foot in one minute. How to find the horsepower required to lift 400 tons a distance represented by the number of feet a train will rise in one minute when going at 20 miles per hour up a 3.6 per cent. grade we must first find the vertical lift in feet per minute. A train moving twenty miles per hour will travel $\frac{20}{60}$ or 1/3 of a mile in one minute. One-third of 5,280 (feet per mile) = 1,760 feet = distance traveled forward. Now as the grade is 3.6 per cent. of the distance, the rise in feet would be 1,760 x .036 = 63.36 feet vertical rise per minute. Four hundred tons = 400 x 2,000 = 800,000 pounds, and 800,000 pounds raised 63.36 feet in one minute equals 800,000 x 63.36 = 50,688,000 pounds raised one foot in one minute; therefore to find the horsepower required to raise this weight divide by 33,000 and we have 50,688,000 ÷ 33,000 = 1,536 horsepower. You will note in this calculation friction is not considered.

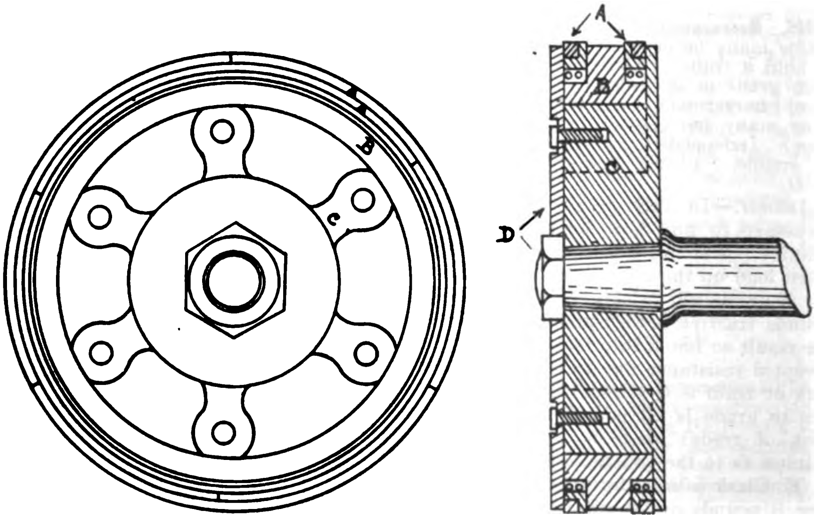

Fig. 1

806. Dunbar Packing.—"Please give a description of Dunbar cylinder packing, and do you think the by-pass valve could be discontinued on a piston valve engine by using the Dunbar packing?"—*C. D.*

Answer.—Dunbar packing consists of two rings on each side of the bull ring, one being of L section and the other, which fits into the lower or L section ring, being of square or rectangular section. Each of the four rings are divided into three or more segments; consequently they have no "spring" as have the ordinary snap rings, but are held to the cylinder by means of steel spring rings of round section as shown in Fig. 1, in which *A-A* each represent one of the packing rings, *B-B* the bull ring, *C-C* the spider and *D* the follower plate. In our opinion the by-pass valves cannot well be dispensed with in a piston valve engine, even if Dunbar packing is used.

807. Pressure in Exhaust Pipe.—"Can you say about what pressure will be created in an exhaust pipe on a 21 x 26-inch engine, the nozzle being 5⅞ inches?"—*C. D.*

Answer.—Too many factors govern this to give even an approximate answer, as, for instance, the height of the nozzle, its form, the volume and velocity of the steam expelled, etc.

808. Engine "Groaning."—"Where would you look for the trouble if an engine groans when working steam but is O. K. when drifting?"—*A. J. D.*

Answer.—This is probably due to insufficient oil on the valve, which groans when the steam pressure is on it but stops when pressure is relieved. It could be due to a badly worn piston head or bull ring, but in the latter case the engine would in all probability blow also.

809. Channel Cock.—"What is the object of a cylinder cock in the middle of the cylinder, there being no slot for the cylinder cock rod? I have noticed them in both simple and compound engines. My impression is that it is a pop valve to relieve condensation in case an engine is started without opening the cylinder cocks. Am I right?"—*A. J. D.*

Answer.—You are right. The cock you refer to, commonly called a channel cock, is placed in the steam channel of the cylinders to relieve the water due to condensation of steam. It is automatic in its operation and, therefore, requires no cylinder cock rod to operate it. In form it is similar to the ordinary cylinder cock, except that the valve, instead of being opened with a rod, is held up from its seat by a light coil spring which keeps it open while the throttle is closed so as to let all condensation drain out; when the throttle is opened, however, the pressure of the steam acting on top of the valve overcomes the tension of the spring and closes the valve.

810. Broken Eccentric Strap.—"Can an eccentric strap broken through the lug hole be patched? If so, how?"—*W. M. C.*

Answer.—Yes. There are several ways in which it can be patched. The best way perhaps would be as shown in Figs. 2 and 3 by making a U-shaped patch to go over the broken piece, the U being bolted or riveted to the strap and also to the broken part; then chip a square shoulder on the good part of the strap below the bolt hole, and use a big flat-headed bolt having a head large enough to insure a good bearing on the good part of the strap and also clamping the broken piece. In case the bolt must go in from the other side, however, use a piece of ¼-inch boiler iron for a washer.

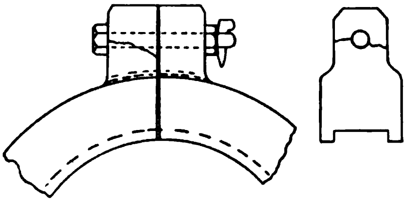

Fig. 2. Showing Crack

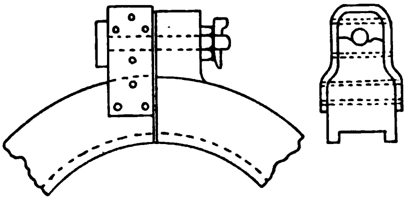

Fig. 3. Showing Patch

811. Sprung Axle.—"How would you detect a sprung driving axle?"—*W. M. C.*

Answer.—There are several ways in which this might be noticed. For instance, if the engine were moving you would notice that the wheels on the sprung axle did not run true, that is, that one or both had a "wobbly" motion. Again, if the wheels mounted on the bent axle had flanged tires you could tell by the uneven wear of the flanges. Again, you could take a tram, gauge or a stick and measure the distance the wheel centers are apart at different points. The probabilities are also that in a case of this kind the journals or pins or both would run hot.

812. Sheared Saddle Bolts.—"What would you do with saddle bolts sheared?"—*W. M. C.*

Answer.—If you had no other bolts to apply it would be necessary to treat this same as for a broken saddle pin, link lifter, tumbling shaft arm, etc., by blocking up the link to a point where you are confident you can handle the train, being careful, however, not to reverse the engine without first changing the blocking.

813. Cramped Engine.—"In running an engine up a coal chute, engine got cramped on knuckle of chute. The engine is an eight-wheel connected consolidation with single truck. The four front wheels and engine truck were over the knuckle, four back wheels and tender were on incline. The valve motion was O. K. Engine was uncoupled from cars. I pumped the engine with throttle open but could not move either way. Had to get the hostler to start me back. Kindly explain in the Magazine where engine was cramped."—*J. C.*

Answer.—There is but one way in which this engine could have cramped herself so as to be unable to move under her own steam, viz., the engine must have had quite a little lost motion in the side rods, and when stopped was stopped in such a position that one side would have been on the quarter and the other side on the dead center. We assume the main rod was connected to the third pair of drivers. Now as the engine stopped with two pair of drivers over the hump and the other two pair on the incline, it is plain that the lost motion in the side rods allowed the side that should have been on the dead center to slip by the center or still hang below the center, as, for instance, if the left side were on the top quarter the right side (assuming it to be a right lead engine) would be on the forward center. If, however, there was considerable slack in the side rods it is possible that the right side instead of being on the exact center was a little below the center; consequently if you now tried to back the engine up, the right side would be trying to roll the wheels forward while the left side would be trying to roll them back, and therefore the engine would be "bucking against itself," or, in other words, the two opposing forces would counteract one another and the engine would not move. We presume the engine could not move forward owing to the cars ahead of it. We can see no other way in which the engine could cramp itself, as, if anything else was cramping the engine so that it could not move itself, whatever was holding should have offered an equal resistance to another engine pulling it off, so that the engine could not have been moved without breaking something.

814. Exhaust Nozzle.—"About what should be the diameter of the nozzle for an engine with 14 x 22-inch cylinders and 44-inch drivers (oil burners)?"—*F. B. H.*

Answer.—If single nozzle, about 4 inches in diameter. The range should be between 3¾ inches and 4½ inches. If double nozzles, each should be about 2¾ inches in diameter.

815. Lead of Engine.—"Do you think ¼-inch lead in full gear too much for above engine (switch service mostly)?"—*F. B. H.*

Answer.—Yes, ¼-inch lead in full gear is too much for any service. If the engine is equipped with Stephenson valve gear you will find it will do much better work with 1/32-inch lead than with ¼-inch, and if engine has the Walschaert valve gear the lead should not exceed ⅛-inch, and even less would be better considering the service the engine is in.

816. Curving of Locomotives.—"Please explain through the Magazine how an engine can make a complete circle, as the wheels are stationary to the axle and the inside rail is much shorter?"—*Canadian.*

Answer.—When locomotives are first turned out of the shops the tires are usually turned coneing, that is, the tires are turned to a smaller diameter on the outside edge than on the tread. This is supposed to assist in curving, as the engine would have a tendency to hug the outside of the curve so as to throw that part of the wheel (next to the flange) having the greatest circumference on the rail curved to the greater radius, and likewise the smallest part of the opposite wheel on the inner or shorter rail, so that the difference in diameters should compensate for the difference in length between the inner and outer rails of a curve. We realize, however, that as tires become tread worn it often happens that the tires will be smaller in diameter at the tread than at the outer edge; consequently there can be no compensation between wheels and curves, but one or the other of the wheels must slip. and this they undoubtedly do. There is quite a difference of opinion among mechanical men as to which wheel, the inner or the outer, does the slipping. The writer is of the opinion, however, that it is more of a slide than a slip that takes place, and that at slow speeds the wheel on the outside of the curve is slid along, while at high speeds the inner wheel is slid along, as in the first case the inside wheels carry the most of the weight, while in the second case the outside wheels carry the most of the weight, and it is but natural to assume that those wheels having the greatest weight resting on them should have the most adhesion, or, in other words, should stick to the rail, while the wheels carrying the lesser weight should slide.

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The Westinghouse Air Brake.

Answers by F. B. Farmer.

463. New York B-1 and B-2 Equipments.—"What is the difference between the New York B-1 and B-2 equipments?"—*J. C.*

Answer.—The B-1 equipment is practically the one that was their standard for several years. That is, it has the automatic brake valve that carries excess pressure in running position, the governor is duplex and it has no straight air or other of the later features.

The B-2 equipments consist of four schedules and are for various kinds of service. The New York Air Brake Co.'s Instruction Pamphlet No. 3 of June, 1907, describes them as follows:

"Schedule B2 covers the single pressure system, B2-HP the double or high pressure control system, B2-S switch engine equipments and B2-HS the double pressure system with high speed attachment for high speed service.

"These equipments differ materially from any heretofore furnished; they not only include all necessary features for the automatic brake but also a straight air brake for the locomotive. With the straight air brake the usual independent brake valve has been dispensed with, the automatic brake valve performing both functions. An accelerator valve has been added to hasten service applications and also a pressure controller to regulate brake pipe pressure, confining all excess pressure to the main reservoir."

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464. ET Equipment Name.—"Why is the ET equipment so named?"—*A. J. D.*

Answer.—It is an abbreviation of engine-tender, indicating that the one equipment is complete for both the engine and tender, inasmuch as the only air part required to operate the tender brake is its brake cylinder.

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465. ET Brake Leaks On.—"What defect will cause the driver brake to leak on when the engine, fitted with ET equipment, is running and both brake valves are in running position?"—*A. J. D.*

Answer.—While the application of the driver brake would be the more noticeable, yet the tender brake would apply equally from any such cause unless it were cut out.

This is evidently the No. 6 ET equipment. With it the equalizing valve of the distributing valve must be in release position of both brake valves to insure against the locomotive brakes applying. In this instance the equalizing valve returned from release to lap because after the use of release position of the automatic brake valve, and which position may have been used longer than necessary, a quick movement to release and back again was not made a few seconds after returning the handle to running position. Also the equalizing valve probably leaked into the application cylinder, thus causing the locomotive brakes to apply. However, it is possible that the application was due alone to the overcharge of the pressure chamber, due to too long use of release and no "kick-off" movement afterward.

Another possible cause of the action described in the question is that the feed valve varied several pounds in its regulation, being out of order, and that the brakes applied while it was shut and the brake pipe pressure was leaking down to its opening point.

Train Rules and Train Practice.

Answers by G. E. Collingwood.

332. Order Not Fully Superseded.—"Please give me your opinion on the following orders:

"Order No. 1: 'No. 42 will take siding and meet No. 43 at New Castle.' Order No. 2: 'No. 42 will meet No. 43 at Spencer instead of New Castle.'

"No. 42 is the train of superior direction. The question is, which train will take siding at Spencer?"—*L. W. H.*

Answer.—The rules declare that an order or *part of an order* may be superseded, and that a train order once in effect remains in effect until fulfilled, superseded or annulled, and that when a part of an order is either fulfilled, superseded or annulled that all other instructions contained in the order remain in effect until they in turn are either fulfilled, superseded or annulled.

To better consider this subject we must bear in mind that a train order is the instructions contained on either a "31" or "19" form train order blank; by "part of an order" is meant any portion of such instructions that can be separated from the order and still leave instructions that can be understood. Under the rules when an order is issued which only supersedes a certain portion of another order, that part of the order which has not been superseded must remain in effect. It may be argued by some that an order to take siding and meet a certain train is only a one-movement order, and that if the "meet" is superseded it supersedes all of the order. To such as think this way we wish to say that the "take siding" part of an order can be superseded and in fact has been superseded many times in the history of the Standard Code, and when the "take siding" portion of an order is superseded it does not supersede the meeting point, which shows that the movements are independent of each other, and this fact should be sufficient to prove to anyone that the "take siding" portion of an order is a "part of an order" within the meaning of the rule, and in case the meeting portion of the order should be superseded the "take siding" portion would surely remain in force unless it was specially superseded.

I can hear some one say, "That's all right, but this order directs No. 42 to take siding and meet No. 43 at New Castle, and the take siding refers to New Castle." Let us consider this view for a moment; the first order contained instructions that No. 42 would take siding and meet No. 43 at New Castle; the "take siding" refers to a meet with No. 43 if it refers to anything, and it cannot be fulfilled without the presence of No. 43 any more than the meeting portion of the order can. If this is not true, then No. 42 could take siding at any place and fulfill the take siding portion of the order. Consider for a moment the intent of the order; it is that No. 42 will meet No. 43 at New Castle and that No. 42 will take siding for No. 43. As long as this first order stands, of course the take siding refers to New Castle, but when New Castle is superseded then it will apply to the new meeting point because it is part of a train order which is still in effect.

We do not wish to endorse this form of order, as it seems to be a poor form, but when it is used the provisions it contains must not be ignored, for all of the rules regarding the life of an order apply to this form as well as to any other. If a train dispatcher desires that the take siding portion of an order shall only apply at one particular point then he should so state in the order, but unless he does so state then the take siding must apply to the meeting point wherever that may be.

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333. A Case of Doubt.—"While I was making a trip on a branch recently I received the following order, which is not clear to me. The order reads: 'Engine 553 will run extra B to D and return to B. Extra 552 is working between C and G.'

"Upon such an order as this have I a right to go beyond C without further orders against the work extra? It is a single track road."—*M. N. B.*

Answer.—The order quoted is not a standard order and, being an improper order, it is not one that the writer can give a standard interpretation to. But unless such orders are authorized by the management of the road, and a proper interpretation furnished for the guidance of trains under such circumstances it should be considered a case of doubt, and the crew of extra 553 would be justified in stopping at C and asking for further orders against the work extra. Of course if the work extra was found at C extra 553 could proceed without further orders.

The Standard Code provides that whenever an extra train is run over working limits it must be given a copy of the work train order. Should the working order instruct a work extra not to protect against extra trains in one or both directions, extra trains must protect as prescribed by Rule 99 against the work extra; if the order indicates that the work extra is protecting against other trains, they will run expecting to find the work extra protecting. The Standard Code arrangement is only common sense, and whether standard rules are used or not, extra trains should be given a copy of the original order held by the work train so that they may know what instructions the work extra has and be governed accordingly.

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334. All Orders Are in Effect.—"Please note the following orders and advise me the procedure under them:

"Order No. 1: 'Engine 4373 works 5:30 a. m. to 9 p. m. between J and L. Protects against work extra 5320 between J and K. Engine 5320 works 5:30 a. m. to 9 p. m. between K and G. Work extras 4373 and 5320 protect against second and third class trains and not protecting against extras. No. 64 Eng. 159 run 1 hour late O to F. All trains due at J up to 5:30 a. m. except No. 25 have passed.'

"Order No. 2: 'No. 64 Eng. 159 run 1 hour and 20 minutes late O to F. Work extra 4373 protects against extra 142 east between L and J after 2 p. m.'

"Order No. 3: 'Engine 3322 works 12:20 p. m. to 8:30 p. m. between F and J. Protects against extra 142 east after 4 p. m. Protects against second and third class trains and not protecting against other extras. Work extra 5320 protect against work extra 3322 between G and J after 1 p. m. No. 64 run 1 hour and 30 minutes late J to F. No. 43 Engine 169 run 3 hours and 30 minutes late F to L.'

"I was on No. 64, a third class train, and held the three orders given above. Had I a right to proceed after one hour late as per order No. 1? I claim I had, as orders No. 2 and No. 3 did not supersede order No. 1. No. 64 ran into work extra 3322 at H, and at the time of the accident No. 64 was 1 hour and 20 minutes late, running with caution. I expected to find work extra 3322 protecting, as it held orders to protect against second and third class trains. You will note that the three run late orders were given in the same orders as the work train limits. I enclose time-table."—*H. J.*

Answer.—We have gone through the time table carefully and find that at the time the accident occurred there was no second or third class trains due at H in the direction in which No. 64 was moving, and therefore work extra 3322 was within its rights in not having a flagman out in the direction from which No. 64 was approaching, and further that No. 64 was disregarding order No. 3 in that it was only 1 hour and 20 minutes late when the accident occurred, whereas order No. 3 requires that it must run 1 hour and 30 minutes late.

In issuing run late orders it is not considered necessary to supersede one time order when another is issued that requires that the train run later than a former order, for the reason that all orders are in effect and must be obeyed, and when a train holds orders to run 1 hour late, 1 hour and 20 minutes late and 1 hour and 30 minutes late the only way it can obey all of them is to run 1 hour and 30 minutes late, and the rules contemplate that it will do so. A run late order is fulfilled at any station when the time expires at such station; for example, order No. 1 was fulfilled at H when No. 64 was 1 hour late at H, order No. 2 would not be fulfilled until it was 1 hour and 20 minutes late there, and order No. 3 would not be fulfilled until it was 1 hour and 30 minutes late at H; therefore with all three orders in effect No. 64 must not leave any station between J and F until it is 1 hour and 30 minutes overdue at such station.

The orders are in accordance with standard forms, and the only criticism the writer has to offer is that the orders are too long and contain too many movements. The rules suggest that orders shall be brief and clear, and must not contain information not essential to the movement to be made.

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335. Must Not Disregard Foot Note.—"No. 32, a second class train, runs A to I daily; leaves A 9 a. m., B 9:30 a. m.; but a foot note on the time-table reads: 'No. 32 wait at B till 9:50 a. m. for No. 21, a third class train, Wednesday and Saturday.' In case we get an order at B to meet No. 21 at C can No. 32 disregard the foot note or must it wait until 9:50 a. m.?"—*J. J. H.*

Answer.—An order that No. 21 and No. 32 will meet at C does not in any way affect the foot note on the time-table which directs No. 32 to wait at B on certain days for No. 21 until 9:50 a. m. The foot note must be obeyed unless No. 32 receives orders from the proper authority to disregard the foot note.

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336. Minimum Time.—"No. 34 is a second class train which runs from A to F. It is due out of E at 3:45 p. m. and due to arrive at F, the terminal, at 4:05 p. m. The time-table shows a minimum running time between E and F of 14 minutes. Can No. 34 leave E on time and run to F in the 14 minutes shown as minimum time?

"The book of rules states that a train must not arrive at a station in advance of its arriving time, and a special rule on the time table says that a train must not exceed its minimum time between stations."—*F. L.*

Answer.—When the arriving time is shown a train must not arrive at a station in advance of such time. The minimum time of No. 34 between E and F is intended to govern that train's movements when it is late. A train must not leave a station to go to another station for an opposing superior train unless it has its full minimum time and clearance as provided by the rules.

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337. Third No. 1 Has Right to B.—"Please note the following orders and advise procedure under them. No. 2 is superior by direction. Order No. 1, 'No. 2 will meet No. 1 at B.' When No. 2 reaches B it finds 1st No. 1 there displaying signals, and No. 2 receives order No. 2 reading, 'No. 2 will meet 2d No. 1 at C instead of B.' Upon arrival at C No. 2 finds 2d No. 1 there displaying signals for a third section. The question is, has third No. 1 a right to come to C for No. 2 or can No. 2 proceed?"—*Wm. Platt.*

Answer.—Rule 218 provides that when a train is named in a train order by its schedule number alone all sections are included and all sections must have a copy of the order. This means that order No. 1 made a meeting point at B for No. 2 and all sections of No. 1, and that all sections of No. 1 must be given a copy of the order, and such order would give each of them a right to go to B for No. 2. But order No. 2 was issued superseding that part of order No. 1 which referred to 2d No. 1, and therefore 2d No. 1 could only go to C as directed by order No. 2, but the third section could use order No. 1 and proceed to B, so that when No. 2 finds 2d No. 1 at C with signals it must immediately get clear of the main track, expecting that 3d No. 1 will be going to B on order No. 1, which has not been superseded. It must be remembered in this case that the rules require that all sections must have copies of the order, and as they are included in the order they can use it unless it is superseded or annulled to each individual section.

This situation makes a complication which can occur on almost any road, and when it occurs on a road that is using revised Rule 94 the situation becomes more serious on account of the added complications resulting under the new paragraph. This part of the situation will be treated fully in a future issue.

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Engine Failures in Snow Storms

An engine failure in the midst of a blizzard or severe snowstorm is very embarrassing, especially if the engine is hauling a passenger train. Very few winter storms have blown over without a resulting list of stalled trains, and it is probable that by far the greater number of these delays is due indirectly to the storm, but directly to engine failures. The causes may be ascribed to arrangements of equipment which are well adapted to the requirements of service under ordinary conditions but which are apt to cause trouble under adverse circumstances which should not be unexpected or unlooked for. Switch and yard engines are often used to double with passenger and freight engines when more power for bucking snow is required. These locomotives are seldom as well equipped as those in road service, and when the call comes, the time is usually too short for the roundhouse foreman to make any changes in equipment. Too often a failure of the assisting engine places the crew of the train at a greater disadvantage than would have been the case if the train had been handled as usual. Often the responsibility for the issuance of orders resulting in the sending out of these engines rests with men who are apt to act hastily in times of emergency such as a severe winter storm occasions. It would seem that a certain amount of foresight at headquarters would sometimes obviate such difficulties by arrangement of a system to be followed in case branch lines become cut off from communication. An instance in mind is that entailing the sending out of a switch engine coupled ahead of a passenger engine on a branch line during a blizzard. The locomotive was ordered out on the advice of the traveling engineer in spite of the objections of the regular crew, who preferred to go through alone. The switcher had been in service all day and its fire was in a very bad condition. The grates were of old style and a quick cleaning of the fire was impossible. The train had proceeded but a few miles when it was observed that the head engine was not producing the power necessary to carry itself, to say nothing of rendering any assistance to the train. After proceeding a few miles farther its fire was almost entirely killed by snow in the coal, and the train was stalled.

There are several features of locomotive equipment which are well suited for favorable conditions, but which are prolific causes of failure in times of cold and storm, and which might be remedied. Among these is noted the air pump intake. The location of this intake is usually such that it is not possible to reach it while running; and there are times when a stop would result in stalling the train. A sleet or wet snowstorm will coat over the strainer so that the air is excluded and a dangerous state of affairs is the result, unless the strainer can be immediately cleaned. It is suggested that the intake pipe be brought back to a point easily reached from the cab window, it being necessary, of course, to keep it outside of the cab on account of the warmth of the interior air. While in ordinary circumstances the presence of snow in the coal does not seriously affect the fire, yet the switch engine mentioned above could probably have been kept in service had a canvas been stretched across the top of the tender. The bearings on many locomotives are fitted with water coolers to be used in keeping the journals from becoming seriously heated when time does not allow of repacking. These coolers are of little use at times when they are needed worst, as hot boxes develop most often when bucking snow. Steam jets could be arranged in such a way as to keep these coolers thawed out, without undue complication and some failures could thus be avoided.—The Railway and Engineering Review.

Railway Club Proceedings

*Organization.**

"An organization is a whole, composed of parts, each having a special act and relation, each essential to the existence of the whole and of each of the parts, the parts partaking of a common life and being mutually dependent."

The most perfect example of an organization is man, with physical, mental and spiritual functions exactly suited to their special duties, harmoniously doing exactly their share for the good of each and of the whole. Whether or not man was created from some poorer original by gradual improvement during 300,000 years, honor and admiration must be paid to his Creator.

In the analogous but even more complex affairs of business, when, in order to accomplish some great end there must be secured the collective effort of many men, there is needed an organizer, whose ability in many cases may well be called divine. He is not given 300,000 years for evolution, but must secure "results" in much briefer time. It is not surprising if his organization be imperfect in one or more particulars, near-sighted, or lacking one of the digestive fluids; or without appreciation of the fundamental good beneath every human society; or without sympathy for the highest needs of every class of employee;—while vigorous of heart, capable in expulsion of waste material from the digestive tract; and alert in the reception, translation and use of mental facts.

The above suggestive deficiencies in organization are the result, not only of time limits, but more of human imperfection. How many a manager, great-souled in planning, has been at times well-nigh appalled by the inefficiency of the average man! Let him take heart in knowing that this century is perhaps but the middle period in human evolution, and his may be the honor of being one of the greater forces of progress when history shall have told of the thousand centuries yet to be lived.

Tonight let the key-note of thoughts on "Organization" be—the feeling of responsibility to mankind. The French have a proverb "Noblesse oblige," nobility imposes obligation, leadership carries duty, opportunity—calls for its right use, influence—that it should be exerted and wisely, official position—that the officer should govern for the good of owner and men and public. "Verily," said the Great Teacher, "If any among you would be great let him be the servant of all," and today that is being practically exemplified by those greatest managers of men who have taken as their scheme of life—*service.*

A remarkable, a far-reaching, change is going on before our eyes. Alongside of a concentration of organization such as the world has never before seen, has developed a new sense of fairness to all men. Public Sentiment, that impersonal, that which the culprits would like to believe evanescent and imponderable, that mighty power in any nation, has laid its great hand upon the leaders and is teaching and requiring a Square Deal. The economic value of great organizations seems too plain to anticipate a backward step. These which are so often feared by the citizen at large, need not be feared if he will feel a confidence in the guiding power of enlightened Public Conscience. The great organizers of today are indeed privileged to be aided in their highest motives by the wide-spread sense of man's duty to other men.

To speak in the abstract of impersonal ideas is frequently to obscure one's subject, and enlightenment comes from clothing the ideas with persons and facts, as the Welsbach mantle is needed to change the heat of the Bunsen burner into a powerful illuminant. Organization pre-supposes an organizer. Upon him, then, depends success. The call is for industrial leaders able to see broadly over the needs of a business, to sub-divide and plan its work into departments, to understand men and study their personalities, to train them and to select the right man specialized and qualified for each place. Upon an Eastern road with which I was connected last summer, the foreman of the most important roundhouse remarked to me, "I try to put a man into a job which I judge he is capable of doing, and that makes him work well and like *me*." That foreman thereby showed me the clearness of his official understanding and one secret of his past success and personal popularity. If he develops the wide-visioned ability to plant out an organization as well as he has developed the choosing of individuals for filling the places, that man will be wanted "Up higher."

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*Paper by Prof. H. Wade Hibbard, Professor of Mechanical Engineering, University of Missouri, Columbia, Mo.

Why do organizations vary so in excellence, one concern wasting in production what its skill saves in selling, one department glaringly (to the outsider) inefficient while another department is the pride of the plant? Such a condition is most often due to the one-sidedness of the head of the concern. He rose to the top from a humble position in one department, and yet failed to appreciate as he ascended that special knowledge of other departments must be actively sought if he would become well-rounded and fit to guide all departments. Therein is seen the wisdom of the squarely assumed policy of America's greatest railway; to promote successful officials, those from whom the future general manager, vice-presidents and president will come, not necessarily up along through one department, as the mechanical, but from one department across into another.

It is instructive to observe the scheme of a "modernizing engineer," that creature of today's desire to get up-to-date, as he approaches his problem of improvement in office, factory or repair shop. He early makes a graphical chart, with lines descending from one officer to those immediately under his leadership, and then from each of them down to those next subordinate, and so on down to the individual groups of workmen; or he follows stock or power or losses through the shop in a similar way. Many of the great department stores have seen the wisdom of themselves making up "organization charts" of this character. They illustrate clearly, forcibly and quickly through the eye, the lines of supervision and of responsibility, the needs of co-operation, the possibilities of leaks, the desirability of changes.

And while upon this scheme of reaching and impressing the brain through a picture, let it be known that there are great opportunities, well understood and used by engineers, consulting accountants, auditors, professors and business men, in plotting data. By different lengths of bars, by filled and unfilled squares in a checker board, by curved or irregular lines whose varying vertical distances from a horizontal base line depend upon the numerical data—may be shown relative expenses, increasing costs, comparisons between the results achieved by different officials, improvements or deteriorations in business, in equipment, in stock, in pay-rolls, and many others, shown in a way to be comprehended quickly by an official whose time is limited. Furthermore, by a curve plotted for a series of years or months the general shape of the curve is seen and it can be continued beyond existing data, thus predicting the future and placing in the hands of the official the ability to provide for probable future needs. In the largest sense, graphical interpretation of results enables the manager to see more than he could otherwise see of his business, without confusion or error.

If "Noblesse oblige" be the key-note of organization, and this sense of service to fellow-men be the guiding principle for the official, if he have the vision to comprehend all the needs of his business—what are the character qualifications such an officer should have? How shall he be a perfect man mentally and thus secure a perfect organization to aid him in his work? I do not propose to add to the definitions, lists of which have from time to time been seen. Let each man study his own excellencies and short-comings, being delivered from pride, dismay, or morbidness by the saving grace of common sense. Let him ask himself if he has *honesty* in its many sides, *enthusiasm*, *assertiveness*, *energy*, *promptness*, *tact*, *patience*, *brains*, *education*, *resourcefulness*, *initiative*, *health*, *courage*, *grit*, *geniality*, *kindness of heart*, *unselfishness*. Can he inspire most of these qualities in his subordinates? Can he get them to *want* to do what he wishes them to do? Does he do what he has to do a little better than another fellow, and do more? Has he the habit of analysis and the ability to reason logically, doing both quickly and practically? Has he the executive ability to carry his ideas into effect in a practical manner? Is he thoroughly approachable for the least important employe? Does he inspire a feeling of frank confidence toward himself on the part of all employes? Does he possess a genuine love for his men? Is he able to put himself into their point of view?

All these basic qualities of character and others un-named may seem idealistic, but some of the greatest railroad men and manufacturers of today hold these ideals and live closely up to them. The writer has been fortunately so situated as to know this for a practical fact. Furthermore, these men are training their subordinate officers towards these ideals, by illustration, by indirect precept, by hint and suggestion and discussion, by definitely arranging opportunities for them to practice. And as officers show capacity and improvement, they are placed higher up in the organization. Thus from top to bottom, and, as the evolution of years goes on, from bottom to top, the officers become imbued with the policies of the manager, with loyalty making his policies their own.

Some definite concrete applications of management ideas may give food for thought and practice:

An officer should have the ability and inclination to unload work and responsibility upon his subordinates instead of trying himself to handle the details and routine work, soon to be swamped by them: training his subordinates to be increasingly efficient, and thus to set free more of *his* time for attention to further and new and larger matters pressing for solution. Proper arrangement of work to each subordinate will enable that subordinate to get his work thoroughly in hand, and to present such reports to his superior as will enable the latter to understand difficulties at once and solve them without waste of time.

Always have someone in mind who would fill each man's place if necessary. A recent unexpected vacancy on the Lake Shore & Michigan Southern Railway was filled in three minutes. An officer is judged by the assistants he gathers around him. Later on, these "understudies" will be ready to take up his work if he be laid aside. An officer who is willingly training a man to be able to take his own place shows his own strength and indicates a capacity warranting his own promotion. A certain important trunk line will not promote an officer who does not have an understudy ready to take his place. All of its officers get a two weeks' vacation yearly, to show up their understudies. If the efficiency of an organization is appreciably affected by the temporary absence of any one man, that organization needs improvement.

Never, under any circumstances, reprove officers in presence of their men; there may be some criticism or request for explanation regarding work on the spot, though not to be heard by the men; but reserve all severe criticism for the private office. In all of this, remember that criticism should be *con*structive not *de*structive; encouragement, not faultfinding. Never disparage one foreman when talking to another.

It is the duty of a superior officer to correct the first sign of discord among inferior officers. There must be team work and co-operation.

There should be held regular monthly or semi-monthly meetings of officers of approximately the same rank, presided over by their superior officer, with a stenographer. These will form cabinets, in which discussions are held upon topics of importance to its members and to the chairman. In instituting these, he will need to lay out the lines of discussion, previous outlines preparing the members for what is to come up.

In shops which have more or less fully adopted the modern system of "Functional Management" a new type of foreman has developed, the Functional Foreman. A workman is under the direction of eight sorts of specialists; three who plan the work and may be called Order of Work or Route Men, Instruction-card Men, and Cost and Time Clerks; four who show the workman how to carry out their instructions, who may be called Gang Bosses, Speed Bosses, Inspectors, and Repair Bosses, and one man for the entire establishment known as Shop Disciplinarian. Where this system has been introduced, it has appeared to give many advantages in the handling of the men and in the selection and training of the subordinate foremen, as compared to the older and therefore more commonly used system of combining all of these functions in each one of many officers. It is easy to build a new shop plant, but it is pretty hard, after it is placed in operation, to perfect the organization to get the most out of it. One man who is capable in all of these eight functions is a prize. To gather fifty such bosses is impossible, except after years of training, selection and discard. But it is easy to find a man adept in one function, and a force of such functional foremen may quickly be discovered and placed in charge. You are urged to study the remarkable paper by President Taylor on Shop Management, in Volume 24 of the Transactions of the American Society of Mechanical Engineers, comprising 120 pages of complete description of improved shop systems which are meeting with marked favor.

A new foreman should not be too quick to institute needed changes by wholesale and prompt overturning of customs. First let him get quietly and thoroughly acquainted with all sides of the situation and the men. If the methods of work need to be speeded up all around, let him do it gradually, possibly with only one workman at a time, thus avoiding united opposition. Avoid the bulletin habit.

Every bit as great care should be taken in getting new men and apprentices as in getting new machines, and they should not only be started right, but their development provided for. Machines inevitably depreciate, even 10 per cent. per year, and more as improved machines are invented which render existing machines out of date; but men, if properly cared for, may appreciate in value many hundred per cent. An organization can never become strong unless it has some well thought out plan for recruiting and raising the level of the men in the ranks.

In the handling of infractions, the officer should recognize his own delicate position in his having to perform as one man the several duties which in the public courts of justice are considered to be best performed by several men. He is the law-maker, the injured plaintiff, the policeman, the prosecuting lawyer, the jury on guilt, and the judge to penalize. There is likely to be no higher court of appeals to reverse his decision, except public sentiment or a strike. Such a position is sobering, and calls forth the greatest qualities of the man of highest character. The detection of infractions on good discipline should be quick and certain, in cases where there ought to be such detection; an officer ought not to appear to notice every fault. An officer should realize how exceedingly serious it is to discharge a man; it is the penalty of last resort, after everything else has failed to bring about a change in his ways.

Much thought may well be spent upon making the shop a nice one for the workmen, *if this can be done without much apparent expense.* Workmen prefer to receive higher wages, to spend for themselves or families in such ways as they choose, instead of having too nice shop surroundings.

Of all the relations between employer and employed, the wage question is probably the most productive of disputes. The first desires to buy with his dollar the largest product, while the second desires to get as many dollars as possible for a day's work. There are in use many systems of wage payment intended to satisfy both of these two points of view, for undoubtedly the best interests of employer and employed are identical. Mutual distrust is of long standing, a heritage of the age when labor relations were those of master and serf, and the latter was determined to do as little as possible for his bare living obtained. Today that wage system is to be preferred which *in the long run* induces workmen to put forth their best efforts. Systems which were thought to have accomplished this, have failed and are failing in the long run, usually because they were founded upon an imperfect knowledge of workmen's speed capacity. The clearest investigations in this latter field have been made by President Taylor and may be read in Volume 24 of American Society of Mechanical Engineers referred to above. He gives the results of twenty years' experience in developing a method of accurate time study based upon timing each of the most minute elements combining to make up a given operation. Every attendant circumstance must at the same time be recorded, which in any way affects the speed of performing the element. The machine used is also given the same time-study as to its elements. With this is a system of instruction, definitely prepared for each operation, to teach the workman how to make the maximum speed, and a wage system to give great reward to the workman who attains the maximum speed. According as the operation requires a greater degree of mental or physical effort, an increase in a day's wages of from 30 per cent. to 100 per cent. above the usual, old-fashioned day's pay, is required to induce the attainment *and* retention of maximum speed. These correlated ideas have been working satisfactorily in a number of shops for years, and the ultimate solution of the wage problem seems likely to lie in this direction. It follows the analogy of modern engineering design, which has become concentrated in the drafting office. So this modernized labor management gets its concentrated initiative in the office of the Planning Department. It is the opinion of the writer of tonight's paper that nearly every wage plan can be made entirely successful, if the good features of all the other plans are grafted upon it with sufficient care, and the plan administered with far-seeing wisdom. In the last analysis, the perfect wage system will depend upon an expert study of the capacity of the individual machine and of the entirely individual operative, and a study of how best to influence human nature to bring out those capacities.

Closely related to wages, among the problems of organization, is the Labor Union. There is one fundamental principle to be remembered; neither the possessor of a place to labor (the capitalist), nor the possessor of labor (the laboring man), is solely responsible morally to himself alone for the use or disuse of that place or of that labor. There is a most apparent dawning of the American principle, that there is a third party in industrial disputes, the Public, which needs the product resulting from harmonious co-employment of capital and labor. The laws which surround and protect both the capitalist and the laboring man are granted and enforced by the Public. In return, the Public demands the use of both. If they cannot find a way of harmony, the Public will have to find it for them. It would be with the most extreme reluctance that the Public would deprive either one of its present freedom in the use of its special equipment, and there is the utmost faith that the good sense of the enlightened American capitalist and laboring man will with patience solve the difficulty to the satisfaction of all three parties. It should be remembered, however, that the Public is supreme over both, and will see to it that exact justice is meted out to both.

Trade Unions are a historical outcome of injustice. They have done a great service in improving the conditions of work. This service is not yet ended wherever the selfish, unprincipled employer still exists.

Where frank and fair treatment is exercised, a Union is of little use and should certainly have no harmful effect upon good discipline.

The officials of a company have little opposition to a union, if its leaders are cool-headed, responsible and reliable; therefore such officials should keep in close, sympathetic touch with the men to aid and induce the best men to be in control of the Union.

Methods of wage payment which permit individuality to assert itself and gain its appropriate reward, remove one great incentive to use the powerful lever of the Trade Union in unwise fashion.

Whatever will accentuate the mutual nature of the interests of employer and employed will diminish the men's need of a Trade Union.

The moral effect of individual ownership of homes is a great steadier upon the men. It is everywhere recognized in all sorts of affairs, that such ownership renders a man much more stable and thoughtful. The well-wisher for the company and the men should therefore promote the building and loan associations, assisting in their careful and honest administration as by suggestions to their auditors.

Old age pensions after long service are eminently desirable. Sickness, accident and life insurance may be promoted by the company, but if it has an actual financial connection with the insurance, great care must be exercised not to give the men the impression that it is making money or is trying to hold the men to the company thereby.

In essence, let the rule, "Do unto others as you would like to have them do unto you," guide both employer and employed in their relations to each other.

The importance of right organization is seen in the reply made by Andrew Carnegie when he was asked by a group of financiers whether he thought that the difference between one style of organization and another amounted to much, providing the company had an up-to-date plant properly located. He said, "If I had to choose now between abandoning my present organization or burning down all my plants which have cost me millions, I should choose the latter. My plants could be rebuilt in a short while with borrowed money, but I could hardly replace my organization in a generation." The president of a locomotive works says, "I do not wish to be understood as underrating the value of a high grade mechanical equipment, for if success is to be attained, the equipment must be the best of its kind for the purpose. But I do wish to emphasize the greater necessity for possessing as highly efficient an organization as can be secured. A capable organization can make the best of a poor equipment and prodce good results, whereas an incapable organization will not only fail to make a fine equipment productive of good work, but probably in a short time will destroy the equipment itself."

On the *spirit of foremanship* the general superintendent of a mechanical plant employing 24,000 men said to the writer, "A new foreman is not 'boss' but leader, and if his men do not 'ratify' my nomination he goes no higher." That is generally the best government which is supported and upheld by the governed, with least friction and display of authority. Last December at the American Society of Mechanical Engineers, Mr. Gantt's keynote on the Training of Workmen in Habits of Industry and Co-Operation was "The general policy of the past has been to Drive, but the era of force must give way to Knowledge, and the policy of the future will be to Teach and to Lead, to the advantage of all concerned." In fact, we can expect an official so to train his men that he will be like what Theodore Roosevelt described about himself, when he was asked at Montauk Point, on the return there of the troops from Cuba at the close of the Spanish War, how he felt leading his men in the charge up San Juan hill. He replied, "I did not lead; I had to run like —— to prevent being run over by my men."—April 9, 1909, meeting St. Louis Railway Club.

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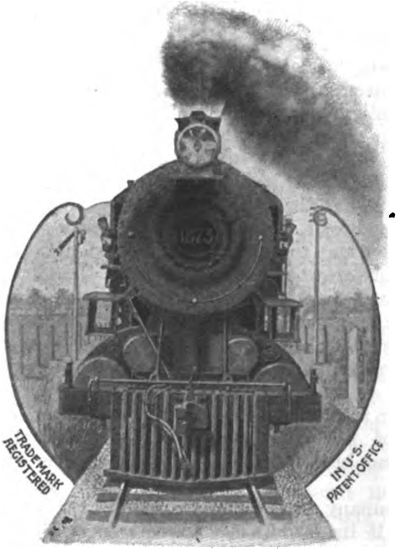
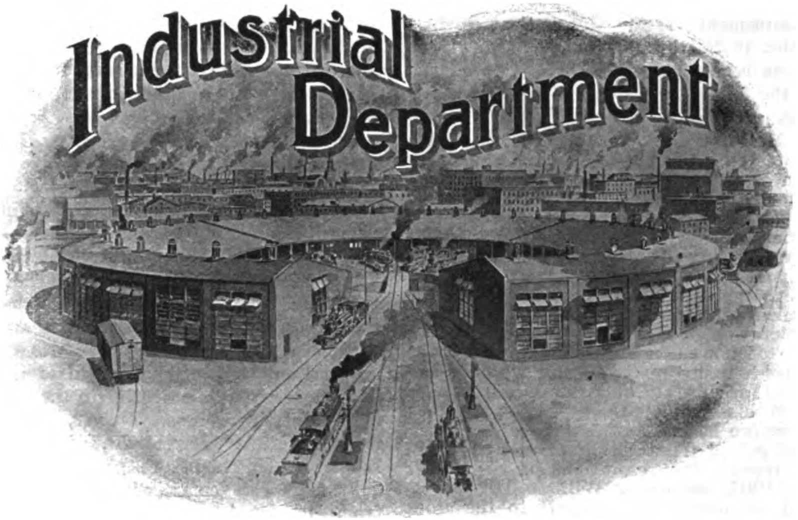




DISCUSSION OF CURRENT TOPICS

Weed Out the Traitorous "Organs."

The Shoe Workers' Union has for many years patronized the labor press by advertising therein its union label, at the best advertising rates. The Douglas Shoe Company has in the past withheld its advertising patronage from the labor press. Since the present struggle has commenced between the Boot and Shoe Workers' Union and the Douglas Shoe Company, the Douglas Shoe Company has tendered advertising contracts to labor publications generally, in the hope of overcoming the injurious effects to its business occasioned by the Boot and Shoe Workers' Union withdrawing from that firm the use of its union label.

A few so-called labor papers have been so inconsistent as to not only accept such advertising business tendered by the Douglas Shoe Company, but in an attempt to justify their action in so doing and "square" themselves with labor organizations in their respective localities, have also brazenly attacked in their editorial columns the position of the Boot and Shoe Workers' Union and defended the attitude of the Douglas Shoe Company in the present controversy, hoping thus to enjoy the benefits of continued recognition as labor papers and at the same time profit by supporting labor's antagonists.

Amongst the few supporting the Douglas Shoe Co. is one in Brockton, Mass., known as "The Brockton Searchlight." Since the present trouble started between the Boot and Shoe Workers' Union and the Douglas Shoe Company copies of this sheet have been circulated freely throughout the field of organized labor, the cost of such extensive circulation being no doubt borne by the Douglas Shoe Company in the hope that through its misrepresentation of the merits of the controversy, members of organized labor would be misled into believing that the Shoe Workers' Union was unreasonable, and, generally speaking, in the wrong, and their sympathy be thus alienated from that body.

"The Brockton Searchlight" has in the past laid claims to being a labor paper because of resolutions of endorsement voted to its proprietor nearly two years ago by the Central Labor Union of Brockton. With a view to substantiating its claims to being an authentically representative organized labor paper its proprietor embodied a copy of these resolutions of endorsement in a circular letter sent broadcast over the country in behalf of the Douglas Shoe Company.

The Brockton Central Labor Union, however, recently took the very proper and consistent action of withdrawing its endorsement from "The Searchlight," which it did through the adoption at one of its regular meetings a few weeks ago of the following resolutions:

> WHEREAS, This Central Labor Union of Brockton, Mass., on Sept. 11, 1907, adopted resolutions endorsing one William D. Dwyer, and his paper known as "The Searchlight;" and
>
> WHEREAS, These resolutions and this paper are now being used contrary to the purposes intended by the resolutions in an attempt to injure the Boot and Shoe Workers' Union, a recognized trade organization affiliated with the American Federation of Labor, and to promote the sale of nonunion shoes made by a large Brockton shoe manufacturer who has imposed a substantial reduction in wages upon his employes by unjust means; therefore be it
>
> *Resolved*, That this Central Body hereby repeals the resolutions of September 11, 1907, endorsing William D. Dwyer, and we pledge our support to the Boot and Shoe Workers' Union to the end that they may secure a restoration of the wages which we believe were unfairly taken away from their members; and be it further
>
> *Resolved*, That the overwhelming sentiment in this community is favorable to the Boot and Shoe Workers' Union in the policy of resisting reductions in wages unjustly imposed.

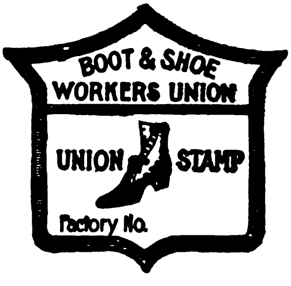
The foregoing resolutions speak for themselves. They make it clearly evident that the Brockton Searchlight, masquerading as a labor paper, has been endeavoring by every means in its power to drive the dagger of treachery to the hilt in the very vitals of the cause which it has so falsely professed to uphold. It is but a few months since this sheet was denouncing the Douglas Shoe Company, but lo! experiencing a peculiar change of heart it has for many weeks, under one pretext or another, been industriously antagonizing the Boot and Shoe Workers' Union.

The action of the Brockton Central Labor Union should be quickly followed by all Central Labor bodies in localities where so-called official labor papers have been thus attacking the cause of organized labor. The course being pursued and the attitude assumed by such papers in the present controversy between the Douglas Shoe Company and the Boot and Shoe Workers' Union should be a warning to all Central Labor bodies to carefully consider the character and identity of the individuals seeking from them an endorsement (or commission) for a paper which would make it their "official" publication.

Unfortunately there are many interlopers and adventurers seeking to exploit union labor influence with a view to the advancement of their own selfish interests. They are not in sympathy with organized labor or its aims and purposes. All of their professions of interest in it are made for "revenue only." Not being mechanics, or, in fact, regular wage-earners of any kind, they secure a mere nominal connection with organized labor, as such identity is essential to the carrying out of their plans. Dwyer, editor of the dethroned "Searchlight," joined the Laborers' Union before getting his endorsement (his commission, as it were) from Brockton's Central Labor body in September, 1907.

Many of these fellows, having once entrenched themselves behind the proprietorship, editorship and management of an "official" labor paper, industriously proceed to impress local politicians and others with the belief that they "control" the labor vote in that particular locality, and that their "influence" is, therefore, well worth having, etc. The sooner that all such sheets are weeded out of the trades union movement the better most certainly will it be for organized labor in general, and this weeding out process cannot be begun too soon or be conducted too vigorously.

In the meantime every member and friend of organized labor should see to it that he purchases no shoes except those which bear



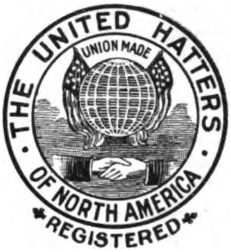
This Label:

Stand by the Hatters' Union.

The Hat Manufacturers' Association, by the use of the injunction and other weapons of tyranny, is still trying to crush the Hatters' Union and carry to a successful issue the boycott it has declared against the union label of that organization. In its struggle for the life of its union and the continued recognition of its label, the Hatters' Union is still determinedly waging its battle in defense of the great fundamental principles upon which all organized labor is established. It, therefore, becomes the duty of every Brotherhood man and of every other man who has taken a pledge to uphold and defend those principles, to render the Hatters' Union, in this, their awful struggle, such assistance as he may be in a position to extend.

In President Gompers' appeal "To All Organized Labor" and its friends, published in the May issue, it is earnestly urged that a contribution of ten cents be made on the Saturday nearest to the middle of each month as long as the Hatters' strike shall continue. It is also urged upon sympathetic and liberty-loving Americans, in order to prevent the forces of greed and plutocracy from using hunger as the successful lash with which to force the struggling hatters into abject submission, that where possible, contributions of food products in addition to the monthly ten-cent contribution be given. These contributions can be paid through the secretaries of local organizations or lodges, or where this is inconvenient they can be sent direct to Martin Lawlor, secretary of the United Hatters of North America, 11 Waverly Place, New York City, N. Y.

It is the label of the Hatters' Union (The United Hatters of North America) that the Association of Manufacturers and all of the other "Van Cleave" anti-labor forces on the North American continent have united in boycotting—that emblem, consequently, all organized labor should unite in supporting. Let every one of our members and friends, therefore, make sure before purchasing a hat that it bears that emblem—the label of the Hatters' Union (The United Hatters of North America), and in order that no mistake can be made as to what that emblem—that label—is, we reproduce it herewith:


THE UNITED HATTERS OF NORTH AMERICA
UNION MADE
REGISTERED

This is the label of the Hatters' Union —The United Hatters of North America. See that it is in every hat you purchase.

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Cause of Lake Seamen's Strike—Tyrannical Despotism of Lake Carriers' Association Forces Issue.

Twenty-five thousand or more men involved in the recently declared Lake Seamen's strike have had the choice of thus making a stand in defense of their character, honor and rights as American workingmen or becoming veritable slaves in accordance with the plans of the employing interests known as the Lake Carriers' Association, which plans no doubt are a part of the general campaign through which plutocracy proposes to put all organized labor out of business. Included in the ranks of the striking seamen are engineers, firemen, oilers, watertenders, marine cooks and stewards, and the strike is likely, before its conclusion, to involve dock employes, lumber handlers, grain shovelers, and in fact the men of all crafts affiliated with the International Long Shoremen's Association. The Lake Carriers' Association is controlled largely by the Steel Trust. One Harry Coulby, president and general manager of the Pittsburg Steamship Company, which owns and operates the steel trust steamers, is the moving spirit in the present attempt to crush all labor organizations connected with water transportation.

The United States Constitution guarantees to all its citizens the enjoyment of certain personal rights, amongst which is that of becoming affiliated with any legitimate organization one may care to join. With a view to compelling them to surrender this right and as a condition to being permitted to earn their daily brea it is being attempted by the Lake Car riers' Association to force these men into signing contracts providing that they must sever all connection with and refrain from joining labor organizations. Those contracts are as follows:

Copy of Contract Issued for Signatures of Chief Engineers of Ships Enrolled in the Lake Carriers' Association.

You are hereby appointed for the season of 1909 as chief engineer of our steamer ————, first class, at the rate of $175.00 per month, upon the following conditions:

That the company reserves the right to dispense with your services at any time for reasons satisfactory to it. That you faithfully abide by and co-operate in carrying out the rules and regulations of the company in respect to all matters of your department.

As we have decided on the policy of "open shop," you will be expected to, and by your acceptance hereof, will agree to fully co-operate in keeping off the ship any representatives of other interests than the ship and owner so far as your department is concerned, and also to work with any employe of the company, regardless of union or any other affiliations; also, if this company decides not to put or keep the steamer in commission, you agree to serve, if requested, as second engineer on any other steamer of the company to which you may be assigned, without, however, any reduction in the rate of salary above stated.

Very truly yours,
H. COULBY,
President and General Manager.

Copy of Contract Issued for Signatures of Assistant Engineers of All Ships Enrolled in the Lake Carriers' Association.

You are hereby appointed 1st assistant engineer of a first-class boat at a rate of salary of $115.00 per month upon the following terms:

That the company or chief engineer reserves the right to dispense with your service at any time for reasons satisfactory to them.

That you faithfully abide by and co-operate in carrying out the rules and regulations of the company in respect to all matters in the engineer's department on the ship.

As we have decided on the policy of "open shop," you will be expected to, and by your acceptance hereof, will agree to fully co-operate in this policy, and in keeping off the ship any representatives of other interests than the ship and owner so far as your department is concerned, and also to work with any employe of this company, regardless of union or other affiliations.

Very truly yours,
....
Chief Engineer.

Accepted:
....

Copy of Contract Issued for the Signatures of Seamen, Firemen, Oilers and Stewards.

State of ....
County of ....

I, ..., renounce all allegiance to any and all labor unions, particularly the Stewards', Seamen's, Firemen's and Oilers', and I declare it my intention not to join either as long as I follow sailing for a living. I am therefore at the present time a nonunion man, and if I can get a position on a lake vessel, in the event of any strike of any description involving the unions, I will stay by my ship and faithfully perform my duties as such employe as long as satisfactory to the officers of such ship.

(Signed) ....

Subscribed in my presence and sworn to before me this .... day of ...., 19..

....
Notary Public.

Following is the Declaration Required Upon Application for a Position on a Vessel Owned by the Lake Carriers' Association

.............., 1908.

I declare upon my word of honor that I apply to ship free to act for myself, not belonging to any union, and in case of strike, sympathetic or otherwise, will remain on board and perform my duties in a proper and satisfactory manner; also, I will have no one under me except as above.

Signature ....
Home Address ....
City ...., State ....

There can be no better evidence of the justice of the claims of the lake transportation employes' unions, or of the diabolism of the avarice which has prompted this arrogant attempt to crush them than the fact that four companies have already signed contracts with these unions from which all objectionable clauses have been eliminated, and which contracts are the same as last season's, for the continuance of which generally the men are now contending. The companies which signed are as follows: Western Transit Co., The Anchor Line, The Lehigh Valley Transportation Co., and the Rutland Transit Co., the two former being members of the Lake Carriers' Association.

The resolution on the adoption of which the strike was declared says in part:

"Resolved, That we cannot accept the intolerable conditions now sought to be enforced upon us by the Lake Carriers' Association, but we are ready to enter the employment of any ship owner who will agree to fair treatment to our members, and where we can ship as free men, and as union men."

A statement issued by the Lake Seamen's Union bearing on the present controversy says in part:

> "The purpose of the attack being made on the unions at this time cannot but be very apparent to any thoughtful man.
>
> "Through the organizations of seamen on the Great Lakes, wages have been very nearly doubled during the past ten years; indeed, in many cases the wages have been more than doubled. General conditions, cleanliness of quarters, quality of food and other things have been materially improved.
>
> "That is what the unions have been doing; their entire efforts have been directed solely to such ends.
>
> "Objection to the existence of the unions, therefore, can consist only of objections to the things which have been accomplished by them.
>
> "The only reasonable, logical, commonsense conclusion possible to reach, it will be seen, is that the lake carriers object to the improvements made in wages and working conditions by the unions. Their purpose is plainly to again secure unrestricted control of the wages and conditions under which the men on the lakes work, to the end that wages (labor cost of operating the ships) may be reduced to the low level of ten years ago, and working conditions deteriorated accordingly.
>
> "There can be no other purpose. The Lake Carriers' Association is not fighting unionism for the mere fun of the thing. It's dollars and cents they figure upon.
>
> "To the seamen on the Great Lakes, however, the outcome of this struggle means much more than mere dollars and cents.
>
> "It is a fight to maintain the individual liberty and freedom of the men who sail these waters."

There is only one power that will preserve, not only to the men of the unions identified with water transportation, but to working men generally their "individual liberty and freedom" as men and as citizens, and that power is Organized Labor. A general campaign is being waged by plutocracy in a desperate effort to crush that power. This campaign represents a concerted movement on the part of the united capitalistic interests of the North American continent to permanently enslave labor.

With the power of organized labor destroyed and our national and state governments completely in the hands of the money barons, it would not be long until the condition of the working man in America would be as deplorable as that of the peasantry of Russia.

It therefore stands every wage-earner in hand to fully realize that every labor organization that is battling against the aggressions of the combined forces of greed and arrogance is fighting his fight, whether he happens to be affiliated with it or not. Every such organization should therefore have his deepest and most practical sympathy and support, both moral and otherwise.

* * *

Warning—To Our Men of Northwestern Canada.

We desire to direct the attention of our members in Northwestern Canada or wherever else the King of the Road Overalls are offered for sale, to the fact that the employes of the concern which has been manufacturing that particular brand of overalls are at present on a strike, brought about by the attempt of their employers to establish unfair working conditions in their factory, which is located at Winnipeg.

It is a recognized fact that the most deplorable evils beset the clothing manufacturing industry. Quite a large proportion of the garments offered for sale are manufactured for starvation wages in sweat shops, amidst the most degrading and unhealthy environments. The Garment Workers' Union has accomplished much in eliminating these conditions, and since its establishment until recently the King of the Road Overall factory of Winnipeg has been operating under strictly union conditions and in full accord with the principles and requirements of the Garment Workers' Union. Late in the month of April, however, that firm decided to dispense with the union label and operate under the "open shop" system. On the morning that the employes first saw the notices which were posted announcing the new policy of the company, they immediately and without an exception left the factory without starting to work.

The King of the Road firm has recently added a shirt-making branch to its factory. It is to be earnestly hoped that our members in Northwestern Canada and elsewhere will at all times exercise special care in seeing that they purchase no overalls or shirts that do not bear the union label. If they are not very careful in this particular they may, indirectly and unintentionally, be assisting in the work of labor crushing and be unconsciously helping to substitute sweat shop and child labor conditions for those represented by the union label.

The Voice, the official labor paper of Winnipeg, and one of the most progressive and fearless labor publications on the continent, in discussing the Winnipeg Garment Workers' strike, says in part:

> The issue will have to be decided by the men of the West. If they stand by their determination to purchase only union label working clothing, the work will pass over to the other factories or new ones will be established, but there will always be enough union label garments to supply the demands.

It is unnecessary to say that in this particular our men will do their full duty.

* * *

Buy a Song and Help the Hatters' Union.

The Boston Union Publishing Company announces the publication of a stirring song entitled "The Union Label Guard," which is dedicated to the American Federation of Labor. The song set to music (march time) is being sold at the reasonable price of 15 cents per copy, and for every copy sold at that price through the Boston postoffice, Box 2668, the Boston Union Music Publishing Company agrees to pay the United Hatters of North America 5 cents until their strike is settled, and after that to pay a similar amount to some other union in trouble as long as the sale lasts. The publishing company in announcing the song for sale says:

> "Sympathy expressed by prose, poetry or song is but hot air unless backed up by cash, so to all lovers of fair conditions for the working man and woman we invite you to help boom the union label and the hatters by buying a copy of "The Union Label Guard."

Fifteen cents per copy is lower than the usual price charged for good songs set to music, but the fact that five cents of this amount goes to help the Hatters' Union in their struggle should especially encourage its sale amongst members of organized labor and their friends.

The song can be secured by writing to the Boston Union Publishing Company (B. H. Bazley, manager), P. O. Box 2668, Boston, Mass.

* * *

Appeal from the Political Refugee Defense League.

Dear Sirs and Brothers—For twenty months the Mexican patriots and labor leaders, Ricardo Flores Magon, Antonio I. Villarreal and Librado Rivera have been imprisoned without trial in United States jails. They have been refused bail and held "incommunicado" in their cells—that is, denied the right of seeing their families or friends.

The man who has secured their imprisonment and is now seeking their extradition is President Porfirio Diaz, who destroyed all constitutional liberty in Mexico and re-elected himself to office, by force of arms, seven times.

Why does Diaz want them?

Because in Mexico free speech has been suppressed, the right of ballot has been abolished, and the free organization of trades unions made a crime—sixty-four men, three women and four children were recently shot down at the strike in the Rio Blanco mills by the soldiers of Diaz.

Against all these tyrannies the Mexican political prisoners now in jail in the United States have been fighting for ten years.

Upon the testimony of an employe of the Furlong Detective Agency of St. Louis, these Mexican political refugees are accused of attempting to set on foot in Arizona an armed expedition to invade Mexico. This the prisoners absolutely deny, proving on the witness stand at their preliminary examination, first, that neither they nor any of their friends possessed weapons to arm such an expedition; and, second, that they were not in the territory of Arizona at the time. In addition, it was shown that the Furlong Detective Agency was in the employ of the Mexican government; that this detective agency had been pursuing Mexican political refugees all over the United States for years, and that these private detectives had already returned to the waiting Mexican soldiery across the border *one hundred and sixty political enemies of President Porfirio Diaz.*

But the most dangerous attack on American liberties has been the arrest and conviction of the young Mexican editor, Antonio de P. Araujo, who was sentenced to a term of two years and six months in the penitentiary at Leavenworth, Kansas, for publishing a paper in Austin, Texas, in which he criticized the tyrannies of Diaz.

The lives and liberties of many other Mexican refugees depend upon the prompt action of all liberty-loving American citizens to whom this appeal for assistance is issued. Manuel Sarabia, once kidnaped out of the State of Arizona by the Mexican Consul, is among the prisoners to be tried, as well as Encarnacion Diaz Guerra, Calixtro Guerra and Basilzo Ramirez.

But it is not only for the protection of the lives and liberties of these Mexican patriots that the Political Refugee Defense League has been organized, the right of asylum for all nationalities has been attacked in the persons of these men and the freedom of the press jeopardized.

The League calls upon your organization to elect a standing committee of three, which shall be known as the "Labor and Liberty Defense Committee," to act as your representatives and delegate members in the national organization of the Political Refugee Defense League. No dues are to be collected from the membership and all funds are to be raised by voluntary contributions. All questions for decision in matters of importance will be referred to the entire membership by referendum vote. Initiative measures will be accepted from any three organizations joining in a demand for the enactment of such measures.

Elect your committee and notify the National Secretary.

Fraternally,
JOHN MURRAY,
National Secretary Political Refugee Defense League,
180 Washington St., Chicago, Ill.

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THE FEDERAL GOVERNMENT AND THE RAILROADS

BY W. P. BORLAND

The States and Interstate Commerce.

The right of Congress to charter railroads within the boundaries of a state without the state's consent is no longer open to question. That matter was definitely settled by the Supreme Court of the United States in its decision in the case of California v. Pacific Railroad Company, 127 U. S. 1. It necessarily follows that in the exercise of its power to grant franchises for the construction of railroads Congress may establish such regulations as it sees fit to govern the transportation of passengers and property over such roads; and it is undoubted that such agencies of transportation are free from any measure of state control other than the ordinary police regulations.

In delivering the opinion of the court in the case of California v. Pacific Railroad Company Mr. Justice Bradley said:

"The power to construct, or to authorize individuals or corporations to construct, national highways and bridges from state to state is essential to the complete control and regulation of interstate commerce. Without authority in Congress to establish and maintain such highways and bridges it would be without authority to regulate one of the most important adjuncts of commerce. This power in former times was exercised to a very limited extent, the Cumberland or National road being the most notable instance. Its exertion was little called for, as commerce was then mostly conducted by water, and many of our statesmen entertained doubts as to the existence of power to establish ways of communication by land. But since, in consequence of the expansion of the country, the multiplication of its products, the invention of railroads and locomotion by steam, land transportation has so vastly increased, a sounder consideration of the subject has prevailed and led to the conclusion that Congress has plenary power over the whole subject."

The exercise of this plenary power asserted in California v. Pacific Railroad Company means that the national government can fix the charges to be made for transportation over interstate roads from one point to another within the boundaries of a state to the same extent as it may from a point in one state to a point in another. In Stockton v. Baltimore & New York Railroad Company, decided by Justice Bradley of the Supreme Court of the United States, sitting as circuit judge in the United States Circuit Court for the district of New Jersey, August 1, 1887, it was held that in carrying on foreign and interstate commerce corporations equally with individuals are within the protection of the commercial power of Congress, and cannot be molested in another state by state burdens or impediments; also, that Congress can confer upon a state corporation powers not contained in its original charter, and that the power of Congress is supreme over the whole subject of interstate commerce, unimpeded and unembarrassed by state lines or state laws. The principles here laid down are now adjudged law in the courts of the United States, and there is no longer any question of the right of Congress to make all regulations necessary for the control and operation of interstate railroads.

The question of the power of a state to make regulations affecting the rates to be charged for the transportation of interstate commerce was settled by the decision of the Supreme Court of the United States in the case of Wabash, St. Louis & Pacific Railway Company v. Illinois, 118 U. S. 557, decided October 25, 1886, Mr. Justice Miller delivering the opinion of the court. That case concerned the validity of a law of the State of Illinois calculated to prevent unjust discrimination and extortion in the rates to be charged by railroads in the State of Illinois for the transportation of freight on said roads. The court held that in so far as the statute in question affected interstate commerce it was not a valid law, saying:

"We must, therefore, hold that it is not and never has been the deliberate opinion of a majority of this court that a statute of a state which attempts to regulate the fares and charges by railroad companies within its limits for a transportation which constitutes a part of commerce among the states is a valid law."

And again:

"When it is attempted to apply to transportation through an entire series of states a principle of this kind, and each one of the states shall attempt its own rates of transportation, its own methods to prevent discrimination in rates or to permit it, the deleterious influence upon the freedom of commerce among the states and upon the transit of goods through those states cannot be overestimated. That this species of regulation is one which must be, if established at all, of a general and national character, and cannot be safely and wisely remitted to local rules and local regulations we think is clear from what has already been said. And if it be a regulation of commerce, as we think we have demonstrated it is, and as the Illinois court concedes it to be, it must be of that national character, and the regulation can only appropriately exist by general rules and principles, which demand that it should be done by the Congress of the United States under the commerce clause of the constitution."

In the exercise of its power to regulate interstate commerce Congress may annul the provisions of any charter granted by a state to a railroad whenever such railroad engages in interstate commerce, notwithstanding that a charter is a contract and the constitution declares that no state shall pass any law impairing the obligation of a contract. In other words, while a state may not pass a law impairing the obligation of a contract, the United States may do so. Thus Congress may make regulations for the control of interstate commerce which may incidentally affect the movement of intrastate traffic, and there is no power resident in the states adequate to prevent the full and free operation of such regulations. But when the case is reversed and a state in attempting to regulate intrastate commerce makes laws which incidentally affect the movement of interstate commerce, the United States may step in and declare such regulations null and void.

The decision of the Supreme Court in Wabash, St. Louis & Pacific Railway Company v. Illinois was the culmination of a long series of utterly futile attempts on the part of various states to establish and maintain effective measures of control over the matter of railroad rates. Following this decision the impracticability of the so-called Granger laws was definitely recognized, and in 1887 Congress passed the Interstate Commerce Law.

Contributed

Reply to Slason Thompson—Just Compensation the Issue, Not Relative Percentages.

The average reader is not supposed to bear in mind the exact point of controversy between conflicting authorities in a matter that has been meandering through two numbers of a magazine. It is therefore well to state the point originally made by your contributor in the article, "Compensation for the Judicially Disinherited." The object of the article was to call attention to the need of a compensation bill for railroad men when injured, and when killed for their widows, by reason of the regularly recurring professional risk inherent in their work. At present the persons affected are required to bring an action for damages against the carrier. It was shown that the litigation under the existing conditions and under the doctrines of law of Master and Servant involved cruel delays and that damages they obtained were inadequate, unjust, and unfair, because not prompt and certain. As an instance of this allegation, Kane's widow was kept from receiving any damages for 9 years, 10 months and 27 days; Schlemmer's widow is still suing in the courts of Pennsylvania, although the father of her children was mangled to death in 1900, coupling a shovel car with improperly equipped couplers.

In August, 1900, shortly after the Safety Appliance Act had gone into effect, at nine o'clock at night Schlemmer's head was mashed in making a coupling. The Supreme Court on March 4, 1907 (205 U. S., p. 1), reversed the judgment of the Pennsylvania courts, and this action, typical of those of its class, is again on its route of indeterminable delay; what happened to Schlemmer's widow and her children may happen to every one of the 32,824 widows or dependents of those killed outright in the last ten years only of railroad operation.

Speaking of the need of a Compensation Act for 865,227 railroad employes killed or injured in 20 years of railroading, it was thought best to rivet the attention of the reader on the making of widows a by-product of American railroading. The figures printed in the March number of this Magazine had appeared originally in the Congressional Record of May 26th, 1908, in the remarks of the Hon. A. J. Sabath, of Chicago, on his Compensation Bill. The basic or absolute figures of both killed or injured were originally furnished by the carriers themselves and show that in 20 years 53,046 employes were killed, 812,121 were injured, and that 865,227 employes were killed or injured on American railways in that time.

The vast army of 812,121 men injured by 20 years of railroading was not left out of consideration and the point was thought to have been made that both killed and injured should have been paid by the carriers without a suit for damages and all the incidents of delay thereto. Apparently the horror of considering this vast army of 865,227 men killed or injured in 20 years and left to sue the carriers pierced the armor of callous indifference of the Railway Managers' Association of Chicago, because Mr. Slason Thompson, their statistician, felt called upon to attack, not the accuracy of the figures themselves, but of certain percentage columns annexed thereto. This Mr. Thompson does by distorting the text and then claiming that the percentage is misleading, after supplying a year not used in the original table.

By referring to page 409 (March number) any reader of this Magazine can see that Summary A, comparative statement of accidents to railway employes for the years named, contains the absolute number, 53,046, employes killed. These 53,046 employes were killed in 20 years. The per cent. table headed 8.55 per cent. and closing with 3.90 per cent. in 1888, ends up with the significant figure of 100 per cent. This last and significant figure has been carefully omitted by Mr. Thompson under the total of the employes killed. In his communication to the Editor of the Brotherhood of Locomotive Firemen and Enginemen's Magazine, Mr. Thompson states under the heading, "Decrease in the percentage of employes killed," that the percentages given in a table published in the first summary in the March article are misleading.

For the purpose of showing how many men were killed or injured in 20 years, the author of the table in the March number added the number killed in the 20 years, added the number injured in 20 years, and added the number killed or injured in 20 years under three separate and distinct headings. Each one of these three percentages must and do amount to 100 per cent. There is nothing misleading in an absolutely true statement. No argument was made in respect of the decreasing or increasing per cent. of any one factor of the total number of men killed or injured and the statement made by Mr. Thompson that the table is misleading is not based upon fact, is not true, and is intended in its turn to mislead the reader. So much for the formal statements made by Mr. Thompson.

Mr. Thompson proceeds to eliminate all consideration of the persons injured and to place all his reliance upon the alleged decrease of the persons killed.

With the author of the article, "Compensation for the Judicially Disinherited," it is not a question whether the railway employes are killed or injured, as long as under the present system of administration of the law they are denied just, certain, and prompt compensation. It may be contended that a person who is injured and is left a cripple or is thrown on the scrap heap of the industrial defeated, is quite as much entitled to compensation as the survivors of the persons killed absolutely. Does Mr. Thompson, or the General Managers' Association of Chicago, which Mr. Thompson represents, intend to advocate the passage of the Sabath Compensation Bill? Or is his interest in the killed or in their survivors purely academic, or simply for the purpose of claiming that the percentage of killed is to be taken into consideration and the maimed employes of the railroads are to receive no consideration whatever? The ghastly heartlessness of the attitude of the persons whom Mr. Thompson so ably represents is shown in this—that he can find comfort in the fact that the chronic breakdown of the economic system which he represents, resulting in the disastrous panic of 1907, has decreased fatalities to employes. He will not dare to say that the panic or that any other part of the breakdown of the economic system has decreased suffering to the persons at risk—and that is the only point which we have tried to bring before the community. The men who have been killed or injured since and during the panic have had to go through the same farce of suing the carriers at a time when their sufferings and their needs caused by public service should have entitled them to prompt, just and definite compensation.

How does Mr. Thompson's quibbling about the percentage of the persons killed or injured affect this great question?

The two summaries printed in the Locomotive Firemen and Enginemen's Magazine of March, 1909, end with the last official figures available.

This table, when taken in connection with the table which appears below, will show when analyzed that in 1889, out of 704,743 employes in service, 22,000 were killed or injured, while in 1907, 19 years afterward, out of 1,672,074 employes in service, 92,178, or 5.51 per cent. of the employes in service were either killed or injured. The 92,178 persons killed or injured in 1907 represent an increase over the 22,000 killed or injured in 1889 of 319 per cent., while the absolute number of employes in service increased from 704,743 to 1,672,074, or only 137 per cent. It will be seen from the above figures that the percentage of increase of the employes (137 per cent.) would have warranted a proportionate increase of employes slaughtered without being paid compensation up to 52,168 killed or injured had the railroad service not become more hazardous in the last 19 years. In other words, had the rate of killing and maiming which the railroads require as a by-product of their industry without compensation in 1889 maintained the same ratio and not advanced, only 52,168 men would have been killed or injured, viz., 3.12 per cent. and not 5.51 per cent. of the number of employes. But as a matter of fact the railroad hazard increased so greatly that 92,178 were either killed or injured in 1907, an increase of 319 per cent. over the number killed or injured in 1889. That these statements may not appear without basis of detail or substance, there is annexed hereto the following table of percentage of increase or decrease in the number of employes in service, and the percentage of increase or decrease in the number killed or injured in each year in comparison with the preceding year:

SUMMARY.—***Comparative statement showing number of railway employes in service and the per cent killed or injured for the years named.***

[Compiled from figures shown in the annual reports of Statistics of Railways in the United States, issued by the Interstate Commerce Commission.]

Year Ending June 30—	Employes in Service.	Percentage of Increase (+) or Decrease (—) in Number Employed.	Year Ending June 30—	Employes Killed.	
				Number.	Per Cent.
1907	1,672,074	1907 over 1906+ 9.91%	1907	4,534	0.27
1906	1,521,355	1906 over 1905+10.07%	1906	3,929	.26
1905	1,382,196	1905 over 1904+ 6.64%	1905	3,361	.24
1904	1,296,121	1904 over 1903— 1.25%	1904	3,632	.28
1903	1,312,537	1903 over 1902+10.36%	1903	3,606	.27
1902	1,189,315	1902 over 1901+11.03%	1902	2,969	.25
1901	1,071,169	1901 over 1900+ 5.26%	1901	2,675	.25
1900	1,017,653	1900 over 1899+ 9.55%	1900	2,550	.25
1899	928,924	1899 over 1898+ 6.22%	1899	2,210	.24
1898	874,559	1898 over 1897+ 6.20%	1898	1,958	.22
1897	823,476	1897 over 1896— .38%	1897	1,693	.21
1896	826,620	1896 over 1895+ 5.30%	1896	1,861	.23
1895	785,034	1895 over 1894+ .70%	1895	1,811	.23
1894	779,608	1894 over 1893—10.76%	1894	1,823	.23
1893	873,602	1893 over 1892+ 6.35%	1893	2,727	.31
1892	821,415	1892 over 1891+ 4.73%	1892	2,554	.31
1891	784,285	1891 over 1890+ 4.67%	1891	2,660	.34
1890	749,301	1890 over 1889+ 6.32%	1890	2,451	.33
1889	704,743		1889	1,972	.28
1888	(*a*)		1888	2,070	(*a*)

Year Ending June 30—	Employes Injured.		Total Employes Killed or Injured.		Percentage of Increase (+) or Decrease (—) in Number Killed or Injured.
	Number.	Per Cent.	Number.	Per Cent.	
1907	87,644	5.24	92,178	5.51	1907 over 1906+14.32%
1906	76,701	5.04	80,630	5.30	1906 over 1905+14.86%
1905	66,833	4.84	70,194	5.08	1905 over 1904— .71%
1904	67,067	5.17	70,699	5.45	1904 over 1903+10.31%
1903	60,481	4.61	64,087	4.88	1903 over 1902+19.80%
1902	50,524	4.25	53,493	4.50	1902 over 1901+22.08%
1901	41,142	3.84	43,817	4.09	1901 over 1900+ 3.84%
1900	39,643	3.90	42,193	4.15	1900 over 1899+13.62%
1899	34,923	3.76	37,133	4.00	1899 over 1898+10.12%
1898	31,761	3.63	33,719	3.85	1898 over 1897+14.85%
1897	27,667	3.36	29,360	3.57	1897 over 1896— 7.76%
1896	29,969	3.62	31,830	3.85	1896 over 1895+15.71%
1895	25,696	3.27	27,507	3.50	1895 over 1894+ 8.96%
1894	23,422	3.01	25,245	3.24	1894 over 1893—26.73%
1893	31,729	3.63	34,456	3.94	1893 over 1892+11.79%
1892	28,267	3.44	30,821	3.75	1892 over 1891+ 7.02%
1891	26,140	3.33	28,800	3.67	1891 over 1890+15.90%
1890	22,396	2.99	24,847	3.32	1890 over 1889+12.94%
1889	20,028	2.84	22,000	3.12	
1888	20,148	(*a*)	22,218	(*a*)	

(*a*) Figures not available.

Percentage of increase in number of employes in 1907 over number in 1889	137.2601
Increase in percentage of number killed or injured in 1907 over percentage of number killed and injured in 1889	76.602
Increase percentage of number killed or injured in 19 years	76.60
Increase percentage of number injured in 19 years	84.51
Decrease percentage of number killed in 19 years	3.57
Percentage of increase in number of employes killed or injured in 1907 over number killed or injured in 1889	318.99
Percentage of number of employes killed or injured in 1907 over number killed or injured in 1889, as compared with percentage of number employed in 1907 over number employed in 1899	132.3988

As shown by this table, in 1889 the railroads employed 704,743 men; in 1907 they employed 1,672,074; in 1889 they killed or injured 22,000; in 1907 that figure had risen to 92,178. It will be perceived that the increase of employes killed or injured in 1907 over the number killed or injured in 1889 was 319 per cent., while the number of employes in the service of the carriers only increased 137 per cent. in the same period, or that the casualties increased in nearly two and one-half times a greater ratio than the number employed. Had the same ratio of increase of the number employed (137 per cent.) been maintained and not exceeded by the increase in the number of casualties (319 per cent.) when they had 1,672,674 men at risk, the railroads would not have killed or injured 92,178, but would have killed or injured only 52,168 men in 1907.

From whatever view we regard these figures, it shows that the risk of railroad employes is a constantly recurring and increasing risk and that the need for a compensation bill such as H. R. 1, (61st Congress, 1st Session) a revised edition of Mr. Sabath's Compensation Bill is an absolute necessity.

Mr. Slason Thompson arrives "at the more encouraging conditions set forth" in the table of men killed outright because the per cent. killed in proportion to those employed has not increased during the financial breakdown of 1907. If these conditions are encouraging or even more encouraging it is but fair to ask to whom they are encouraging. They are not encouraging to the widows or to the children or to the dependents of 32,824 men who, according to Mr. Thompson's tables, have in the last ten years been killed. Every one of these widows or dependents is or was liable to the hazards of an action at law which might under the rules of the game take nine years, ten months and twenty-seven days, as happened to Kane's widow, or be dragged through the courts the same length of time which Schlemmer's widow finds to be the expression of due process of law as illustrated in the administration of master and servant's law.

If there is anything more encouraging, or even encouraging in the conditions so set forth, Mr. Thompson is certainly correct, and there is no need for any Compensation Act.

CONTRIBUTOR.

Honor to Whom Honor Is Due—Our Friends Indeed.

It has been customary for the Legislative Board of Indiana to give due credit to legislators who render signally meritorious service in advancing the legislative interests of organized labor in general and of the men of our own occupation in particular. We feel, therefore, that we would be derelict in our duty did we not make special mention of two who have served in the recent session of the Indiana Legislature as representatives of the people in that body. These two men are Senator Robert Emmett Proctor, of Elkhart, Ind., and Hon. Chas. W. Kleckner, of Logansport, Ind., Representative from Cass County.

Representative Chas. W. Kleckner.

Mr. Kleckner is a resident of Logansport, Ind. He has, with credit to himself and honor to his constituents, represented his county in the Sixty-fifth and Sixty-sixth General Assembly of this State. He holds membership in the Hod Carriers' and Builders' Union in the city where he resides, and is not only a "card" member but a union man at heart, standing ever ready to fight for the interests of the people who have chosen him as their representative.

C. W. KLECKNER
Representative Indiana State Legislature

His motto is justice and "equal rights to all and special privileges to none."

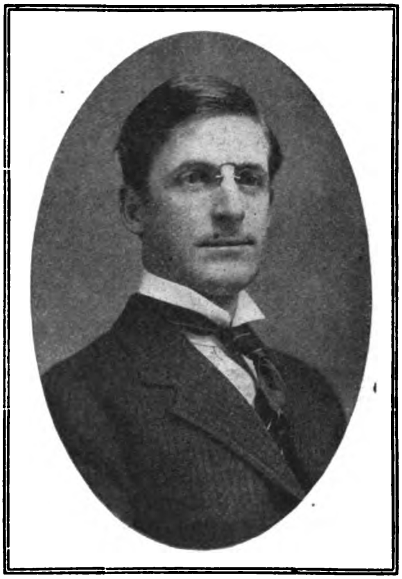
Mr. Kleckner has endeared himself to the hearts of the laboring men of his State and enjoys the respect of every one with whom he comes in contact. By his untiring efforts he has succeeded in getting a bill through the recent (Sixty-sixth) General Assembly requiring all locomotives to be equipped with automatic bell ringers. The locomotive firemen of the State have for six years been trying to get this law passed. In addition to his work in behalf of this measure Mr. Kleckner has championed every other labor bill that has come before the House of Representatives. He rendered especially meritorious service in behalf of the ash pan bill, which he vigorously supported through the House, and which was introduced in the Senate by Senator Proctor. This law is similar to the national ash pan law, and now, by virtue of state enactment, has been made applicable to railroad employes engaged in intrastate as well as in interstate commerce. The voters of Cass County have every reason to feel proud of Mr. Kleckner, as has also any true American citizen. It is indeed to be regretted that we have not more men like him in the halls of our legislative bodies, both national and state, for then we could feel secure in the conviction that the interests of all the people were being guarded and promoted and not those of a select few to the detriment of the many.

Senator Robert Emmett Proctor.

No member of a legislative body, be he within or without the ranks of organized labor, could have proven himself a more fearless champion of its principles or a more vigorous and determined defender of its rights and interests than did Senator Proctor as a member of the Sixty-sixth session of the General Assembly of Indiana just closed. Senator Proctor is a lawyer, and to his defense of the cause of wage-earners he brought all of the skill and ability of a trained mind ponderously effective in its logical, argumentative and convincing capabilities.

Senator Proctor was born in 1883 in Elkhart, Ind., having resided there continually ever since his birth, except for three years that he was a student at Notre Dame University. He is the son of a locomotive engineer who in that capacity has for thirty-five years been in the service of the Lake Shore Railroad running out of Elkhart.

Such men as Proctor add luster to the legal profession. His talents are not for sale to the highest bidder regardless of the merits of a cause which, unfortunately, can be said of a comparatively small percentage of the members of that profession. Like Abraham Lincoln, a cause to enlist young Proctor's services must be based on justice and right. Himself the son of a railroad wage-earner, his sympathies are all with the men who toil, and particularly with those who earn their livelihood in the hazardous occupation of railroad train service. Proctor is typically American in principle as well as by birth and lineage. He believes in equal rights before the law for all citizens, regardless of what their circumstances in life may be, and he acts upon that belief.



ROBERT E. PROCTOR
Senator Indiana State Legislature

In his efforts in behalf of our legislation he was not actuated by a desire to win the plaudits of those he served, but rather by an earnest determination to take full advantage of the opportunity which his membership in the Indiana Senate afforded him to do everything he could to advance the cause of railroad wage-earners and workingmen in general, because he is convinced that that cause is a just one. In his untiring advocacy of that cause he has been known, time and again, to stay up working for the passage of our measures before committees of the Legislature and otherwise until after midnight. Especially was this so in the case of the ash pan bill.

In conclusion let us say that there is no honor in the gift of the American people that is too great to bestow upon such men as Senator Proctor, and we trust that not only our members and the members of organized labor and wage-earners in general, but every friend of labor as well, will bear in mind that he is the toiler's true, staunch, able and fearless friend, and that should he ever again become a candidate for their support at the polls they will act accordingly.

JAMES R. MORRISSEY,
Chairman Indiana State Legislative Board.
W. E. TRIPPEER,
Secretary-Treasurer.

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Prospects for Work in Western Canada.

Owing to the fact that many brothers are of the opinion that work in this part of the country is on the boom and are coming here in large numbers, I deem it my duty to state through the columns of the Magazine the true facts as they exist. While the Grand Trunk Pacific Railroad is a new road under construction, there are plenty of men already here to fill the positions on it.

I would advise all brothers seeking employment to keep away from western Canada until this season's crop starts to move on the railroads, as prospects at present look very dull indeed and will so continue until something of this nature makes business boom again.

MEMBER.

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Federation.

On the question of federation Lodge 13 has expressed itself by resolution as follows:

Resolved, We deplore the fact of our present isolated condition, a condition that does not generate the effective force and influence that is ours by right of the peculiar nature of our industry. We stand heartily in favor of calling together in joint convention the different labor organizations protecting railroad labor for the purpose of devising plans and completing an agreement providing definitely for the concentration of the forces of railroad labor.

We are earnestly in favor of confederation, but are strenuously opposed to amalgamation. Confederation we believe congenial to American institutions; amalgamation we consider conducive to royalty, monarchy, despotism; therefore, we propose that each organization retain its perfect freedom to define by means of the popular vote of its subordinate lodges the amount of support it shall extend to any cause exclusively affecting its own or any other organization.

We suggest that each organization elect by popular vote for short terms a representative for confederation purposes, his principal duty being to place before his organization for their decision issues arising in any branch of railroad labor needing the support of the confederation, also a president to be chosen from any one organization within the confederation, same to be elected to short and limited terms in office, his expenses to be defrayed jointly.

We trust this matter shall reach the consideration of each and every one of the subordinate lodges of the different railroad labor organizations in order that they may debate the movement and give expression to their views regarding its merits. We would deem it advisable that they express themselves for or against the proposition and give their reasons.

We contend the old cry as to confederation to be a fallacy. Let us look to ourselves, get ourselves together and the International Confederation of Railroad Labor shall soon be a reality.

MEMBER.

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The Constitution vs. Labor.

In the April issue of the Magazine Brother Wessell, of Lodge 633, springs a constitutional question on the Brotherhood, viz., "Are the Workingmen Greater Than the Constitution of the United States?" and concludes with the hope that in the near future thirty millions of workingmen will make it known that their will is greater than the Constitution of the United States! I fear his conclusion is untimely and illogical. This is certainly hard on the Constitution that any certain class can supersede or overthrow it, but the strangest part would be the resultant detriment that would naturally fall to the workingmen themselves, the principle beneficiaries of the Constitution; for, be it known, the Constitution, the American Constitution, is their birthright, their protector, their guarantee of life, liberty and the pursuit of happiness, giving them freedom to contract, to labor in peace, to secure beneficial conditions and a fair reward for their labor. What a price has been paid for this glorious Constitution, and, too, by many patriotic workingmen? The blood that was shed on Bunker Hill in the Revolution out of which the Constitution, the masterpiece of written laws, sprung was not shed in vain, and likewise in its preservation on the fields of Gettysburg and Chickamauga, where the blood of many workingmen flowed freely for its continuance and to stand before the nations of the earth as the expression of the will of a free and enlightened people, and that in the future no class will ever say they are greater than the Constitution.

The Constitution has weathered the storms of doubt, secession, erroneous doctrines of State Rights, and the oft-repeated claim that the people are greater than the Constitution, and it stands today the crowning glory and the wisdom of the statesmen who had the nerve to frame it. With it the humblest citizen is made the equal and afforded the same protection as the greatest.

Because of existing evils and the abuses of the Constitution by men in power—even cloaking their wrongs under its protecting arm—it is, therefore, no logical conclusion why workingmen should assume they are greater than the Constitution and in the future seek to overthrow it. God forbid! Let us jealously guard it—the inheritance of the ages. This same great instrument has made it possible for workingmen to organize and assert their rights as free men; to sell their product—human labor—to make binding contracts; to secure beneficial conditions in their employment regarding their safety and health; to really be men among men and not simply vassals as of old. I fear the workingmen in their triumphant rise forget the past, the days of feudalism and slavery. They forget how they wrested the Magna Charta and won the Bill of Rights and even the privations and struggles resulting in their own Constitution.

The brother should have concluded his otherwise most excellent article on this important subject in this manner—that as the Constitution provides for its own amendment, and if these laws pertaining to labor cannot now be declared constitutional, the workingmen must insist on an amendment to the Constitution whereby the Supreme Court can declare them the law of the land. But is there any trouble as to the Constitution? Does not this imaginary trouble lie in the fact that the corporations have the services of the best constitutional lawyers of the country and they are able to run the corporation train past all danger signals—the constitutional prohibitions and limitations—without being called down? They are able to interpose defenses which seem palpable to the court in their pleadings which could be knocked out on proper demurrer by applying purely constitutional principles alone.

Such has been done by the B. of L. F. and E. in the famous Wabash case at St. Louis and the dissolving of the infamous injunction—and what a great victory for the order! No one said then—"We are greater than the Constitution," but all accorded full praise to the Grand Lodge officers and their legal advisers and were indeed thankful they were living under such a Constitution—where the court was compelled to do justice, when justice was accompanied by her constitutional attorneys. Likewise the Eight-Hour Law has been upheld as constitutional, fought and won in the various States by a past general attorney of the B. of L. F. and E. under the constitutional "police powers" of the State. No amendment to the Constitution was even asked for in any of these cases; yet they stand as the law declared by the Supreme Court—our greatest court under our Constitution; and yet how we abuse it! "The fault, dear Brutus, is in ourselves that we are weaklings," and not in our Constitution. Webster won the famous Dartmouth College case by simply applying constitutional principles—the principles which uphold the rights, contracts, and property of the individual even against a great State.

There is enough in the Constitution to uphold every legitimate right of labor if good, honest judges and officers can be secured. The Constitution, while not giving any one the ballot, still, through the States the working men are given the ballot the same as others, and they should with singleness of purpose select judges and officers who would interpret and enforce the laws according to the true spirit of the law and the justice of the cause.

I believe it takes no prophetic eye to foresee the great legal battles of labor in the future. Labor will have her constitutional lawyers on the skirmish line of battle, many of them coming from the ranks, who will use such generalship that the victory will be decisive. Under the police power of the Interstate Commerce clause the freedom of speech and of the press, the right to petition even the Government for a redress of grievances, besides the many other clauses and amendments of the Constitution, the workingmen are given an opportunity to obtain constitutional legislation in their behalf. These constitutional fields are fertile and only need careful cultivation to blossom forth in all that is necessary for the welfare of the workingmen. While labor has rights—sacred rights—safely guarded by the Constitution, there are others having correlative and equal rights. When labor goes too far in asserting her rights the injunction will be used, but there is no reason why labor can not when oppressed use the injunction with like effect. I see nothing wrong with the injunction, if properly used. The abuse of the injunction has brought it into contempt, and not the use. I welcome the day and hope to see it when the strike and the boycott will be displaced by the law and logic—that day when the workingmen will unfurl their banners with the inscription, "The law has her seat in the bosom of God, her voice the harmony of the world; all things on earth and in heaven unite to do her homage—the weak as feeling her protecting care and the strong as not exempt from her power—all embodied in the Constitution of the United States." Let us love and study it, obtaining its inherent possibilities.

W. A. MURPHY.

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Pensioners of Peace.

Representative A. J. Sabath, of the Fifth Illinois district, is very much pleased by the courtesy shown him by "Uncle" Joe Cannon. The Speaker personally saw to it that Mr. Sabath's bill to provide compensation for railway employes was given number 1, thus being the first bill of the House of Representatives in the Sixty-first Congress.

Mr. Sabath's bill is the first comprehensive and well digested plan that has been presented properly to regulate the economic relations between employer and employe and to mitigate the sociologic evils of our time. The method adopted is one that is in vogue in some form or other in every European state save Turkey. The United States and Turkey alone among the powers have no compensation acts.

The present system of administering the law of master and servant is a serious hardship and a rank injustice to wage-earners. The burdens imposed upon them by reason of this system must inevitably cause them to feel that they are the victims of a mistaken public policy. They must feel that they have no lasting stake in the prosperity of their country, and it has become evident to careful observers that workmen as a class have become conscious of a peculiar grievance.

The death and injury roll of industry is something enormous. Reliable statistics, however, are available only for the railway industry. These show that for the past twenty years there have been 43,000 men killed and injured annually on our railroads, or a total of 865,227 employees in the years 1888 to 1907 inclusive. Every time that six minutes elapsed of every day and night during the year 1907 somewhere in the United States a railroad employee was either killed or injured. These killed and injured persons are a direct by-product of American industrial development. To secure compensation, they must, under the methods now in vogue, sue, and be subject to the usual delays of a suit at law. Such suits in the administration of the law of master and servant are seldom closed within a period of five years. In many instances they have dragged on to ten years or more. Notable cases of delay in suits of this character may be found in the various reports of the Supreme Court. Thus, Schlemmer's widow is still suing in the Pennsylvania courts after the Supreme Court of the United States, in March, 1907, handed down a final judgment in her favor (205 U. S. 1), her husband having been killed in 1900; Kane's widow, after 9 years, 10 months and 27 days obtained tardy justice through a decision of the Supreme Court (207 U. S. 593); Taylor's widow began her suit in 1899, and in 1908 the Supreme Court ordered a new trial and the action is on its usual round of indeterminable delay awaiting another final judgment (207 U. S. 120). A multiplicity of similar cases could be cited;

they are mere incidents in a system, the burdens of which must be borne by those citizens least able to bear them and which provides no method of relief under the present system of procedure. The courts are burdened with litigation, public business is delayed, and pauperism is brought about as a natural consequence of the inept system of treating as a question of law that which is purely an economic and social question. It is one which a feeling of pride in our institutions should cause us to treat, as every other civilized country has done, through the recognition of the duty of the modern Christian state to dispense social justice to those engaged in hazardous employments.

The idea of pensioning common soldiers injured in wars is of comparatively recent origin. The general officers received pensions after each war, but only in modern times have the common soldiers been provided for in this way. The community has been treated to the horror of those who saved its existence hanging around the village inns, broken and maimed objects of charity and pity of all those who beheld them. The United States has been fair to those who fought battles in its behalf, and yet battles do not occur every day, while the movement of the commerce of the country requires as intense and as loyal service as that required of the soldier, day in and day out, year after year. Yet those killed and injured in the service of the whole community while moving the commerce of the country over the post roads of the United States are thrown aside as scrap. The law does not give them adequate, prompt, nor just relief from the burdens of their marred and mutilated existence.

Mr. Sabath's bill is a radical departure from the old theories of master and servant and proposes to establish systematic, just, and prompt compensation for those injured or for their families if they are killed. The bill regulates the conduct of carriers of the United States mail on mail routes. It is not bounded by the limits of state lines. Every person killed or injured by a carrier on a mail route is to be paid a portion of his salary or wages, in the form of a continuing recurring payment, or annuity. By this means the persons killed or injured in civil employments will be placed on a par with the veterans of our late wars. The pensioners of peace as well as the pensioners of war are intended to be saved from the disgrace of pauperism or of public charity.

The first part of the bill is called the "Clauses of the Federal Compensation Act." These clauses contain the method whereby compensation is paid by the railroads and other carriers hauling the United States mail subject to the regulative power of Congress. The clauses are followed by a series of sections whereby those carriers who refuse to engage or contract with the Government for the hauling of the mail are forbidden to use the symbols "U. S. M." on their mail cars, or any cars of their trains, and thus are deprived of the protection of those sections of the Revised Statutes and the postoffice regulations which are in most cases more efficacious than a battalion of regulars in guarding the carriers from the consequences of labor disturbances. On the basis of regulation and of contract the privilege of hauling the United States mail is to be used as a method of requiring the carriers to adopt a system of compensation to be enacted by the bill, leaving the railroads to obtain from the government additional payments for this privilege and service, thus changing the incidence of the loss by having the people of the United States in the aggregate pay for the victims of social warfare as they now pay for those who have been injured in the great battles fought years ago.

The effect of legislation of this character will be to give the workman an enhanced feeling of self-respect and economic security. Knowing that he is certain to receive compensation as a matter of right at the time when it is most needed for injuries received, or that his widow will be taken care of at his death without having to depend upon the cold and unfeeling medium of public charity, he will assuredly become a better citizen and feel more contented with his lot in life. The enactment of this measure will, in short, make patriots of American workmen who under our present system are forced to become paupers.

OBSERVER.

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Follow Suit, Brothers.

On May 1st the members of Energetic Lodge No. 35, B. of L. F. and E., adopted resolutions as follows:

Resolved, That the members of Lodge 35, in keeping with our teachings and desirous of being a little help to the striking Hatters' and Shoe Workers' Unions, besides the financial assistance we have given them, do hereby pledge ourselves to buy no hats or shoes that are not union made, and to ask our local dealers to purchase union made goods for our benefit.

Resolved, That we ask the Magazine to publish a list of union manufacturers of hats and shoes, so that other lodges and members of our Order, as well as ourselves, may present such list to the local dealers in their respective localities with a request to furnish goods for sale which are the product of union labor.

Resolved, That should any member of this lodge purchase any nonunion hats, shoes or other nonunion goods without good and sufficient reason, he shall be severely criticized by the members of this lodge and be reprimanded by the president.

Resolved, That a copy of these resolutions be sent to the local divisions of the B. of L. E., O. R. C., and B. of R. T.

L. F. SMITH, President Lodge 35.

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Report of Indiana State Legislative Board.

Pursuant to the instruction of our State Legislative Board in regular session assembled, the Chairman and Secretary-Treasurer of said Board have, during the session of the Indiana Legislature just closed, worked co-operatively with the State Legislative Board of the Brotherhood of Railroad Trainmen, the duly accredited representatives of the American Federation of Labor, and with such others whose co-operation was conducive to the advancement of the legislative interests of our Brotherhood and labor in general.

Unfortunately it was our experience that men who are members of organized labor, and who professed to be exerting their influence in behalf of the advancement of its interests, proved to be false to their obligations and traitors to the cause. However, inasmuch as the names of these men have been given to the lodges of our Brotherhood in the State of Indiana through the medium of our official report we will refrain from presenting the same for publication in the columns of the Magazine. It remains to be seen what will be done with creatures who at the critical moment, while obligated to defend and advance the interests of their fellow workingmen, proved to be friends of the corporations in disguise. We feel that whatever steps are taken to make examples of them must be taken by members of organized labor in Indiana. and, hence, we leave them to be dealt with by our brothers in this State.

Bills Introduced by B. of R. T.

The following bills were introduced by the Brotherhood of Railroad Trainmen and carried to passage:

House Bill 274, introduced on February 2, by Kleckner and known as the "full-crew bill." "A bill for an act concerning railroads, regulating the operation of trains, providing for the number of employes on same." This bill passed both houses February 25.

House Bill 379, introduced by Hay, February 5. This bill is known as the "medical case bill." "A bill for an act to protect the traveling public and the employes by requiring railroads to equip their trains with medical supplies and providing penalties." Bill passed in the Senate March 5.

Senate Bill 31, introduced by Beal, known as the "switch-board bill." "A bill for an act to require the equipment of switch engines with safety devices to provide against the assumption of risk by employes in case of failure to comply." This bill passed February 26.

Bills in the Interest of Railroad Men and Labor in General.

The following bills were introduced in the interest of railroad men and labor in general:

House Bill 350, introduced by Bassett, February 5. This bill was known as the "co-employers' liability bill." "A bill for an act concerning the liability of employers for injuries and death to employes." When this bill was reported out of the committee there was a divided report, as follows: Hay, Bassett and Kleckner recommended that said bill do pass, and a minority report was made by Jay and Switzer, recommending that the bill be indefinitely postponed. The minority report was adopted and the bill indefinitely postponed by a vote of 59 to 23. This same bill was introduced in the Senate and was Senate Bill 202, by Beal, January 26, and was held up by the committee and killed.

House Bill 127, introduced by Kleckner, known as the "50-car bill." "A bill for an act to regulate the operating of trains upon a railroad and to promote the safety of employes and the travelers upon railroads, by limiting the number of cars in a train." This bill died in Senate on third reading.

House Bill 419, introduced by Hay. "A bill for an act to prevent employers from limiting by contract their liability to employes for negligence." This bill died in the committee's hands.

House Bill 256, introduced January 27 by Thornton. This bill was known as the "loan shark bill," setting forth that no broker shall charge more than 2 per cent. interest per month, including all compensation. This was one of the best bills introduced at this General Assembly, and we are proud to say it passed both houses and has been signed by the Governor.

House Bill 428, introduced February 12, by Kleckner, known as the "anti-injunction bill." This bill was passed to third reading but failed to become a law on account of being introduced too late in the session.

House Bill 425, introduced by Bassett, and known as the "child labor bill." This bill passed the House on March 1st as it was written by the State Federation of Labor, but was amended in the Senate until the bill was practically of no use, and died in the Senate after second reading.

House Bill 67, introduced January 18 by Kayser, known as the "miners' qualification bill," providing for examination of miners to be employed in the mines in this State. This bill passed the House and died in the committee's hands of the Senate in the Committee on Mines and Mining.

Senate Bill 188, introduced January 25, by Higgins. This bill was known as the "miners' bit bill." This bill passed both houses and is now a law.

Bills that were introduced for our Board and carried to passage were House Bill 60, introduced by Kleckner, January 14. This bill was known as the "bell-ringer bill." "A bill for an act requiring all companies within the State of Indiana to equip locomotive engines with an automatic bell ringer and fixing the time for this act to become effective." This was a bill that the firemen of the State have been asking for for the last six years, and it is due to the untiring efforts of Mr. Kleckner, Representative from Cass County, that your Board succeeded in getting it through; and then not until the eleventh hour, and through the courtesies shown us by the Governor in receiving the bill on the last day of the session for his signature. It is now a law and is to take effect on January 1, 1910. We got this bill passed Monday March 8, at 3:30 p. m., under suspension of the rules of the Senate.

Senate Bill 293, introduced February 4, by Proctor of Elkhart. This bill was known as the "ash pan bill." "A bill for an act to promote the safety of employes on railroads; providing for the equipment, use and operating of locomotives; defining the duties of public officers concerning its enforcement and stating the time the same shall take effect." This act shall take effect January 1, 1910. and it shall be the duty of the prosecuting attorneys and the Railroad Commission of this State to enforce its provisions. As the national law could not apply to railroads not engaged in interstate commerce this act was necessary to protect the firemen on the small roads engaged in intrastate as well as interstate commerce. Too much praise can not be given to Senator Proctor for the untiring efforts he put forth in behalf of this bill, even going so far as to appear before the Senate Committee on Railroads at 12 o'clock at night, in behalf of its passage. He succeeded in getting it passed on Friday, March 5, at 5:30 p. m., just before adjournment.

The members of the Brotherhood of Lomotive Firemen and Enginemen of the State of Indiana should never forget Representative Charles W. Kleckner, of Logansport, and Senator Proctor, of Elkhart, for the work they have done for them on these two measures, and, in fact, every labor measure that came up found a champion in the House and Senate in Representative Charles W. Kleckner, of Logansport, and Senator Robert E. Proctor, of Elkhart.

Bills That Were Obnoxious and Detrimental to Labor.

The following bills were introduced which were obnoxious and detrimental to labor:

Senate Bill 121, introduced January 18, by Senator Grube, for the Retail Merchants' Association. This bill was known as the "garnishee bill." It brought one of the strongest lobbies to the State House of any measure introduced during the session, lasting from January 18 to February 3, when it was indefinitely postponed through the efforts of the various Legislative Boards. Inasmuch as Senator Grube introduced this bill, when it was reported out of the committee he spoke against the bill and voted for the indefinite postponement of the bill.

Senate Bill 155, introduced by Wood, applying to insurance companies, was bad, but was amended so as not to apply to fraternal organizations.

Senate Bill 190, introduced by Mattingly, applying to insurance. This bill was a very obnoxious bill, but died the death of a lot of other bad bills.

Comments.

Opposition to proposed legislation in the Sixty-sixth General Assembly just closed was considered the strongest that has been manifested for years. Representatives of every corporation and of the Manufacturers' Association were there to oppose all such legislation from the first day of the session to the last; and while some Senators and Representatives were all right on some labor measures and wrong on some others, we found them generally fair, except a few who will always be found ever ready to further the interest of the corporations, and who place dollars and cents in advance of flesh and blood. Too often is this the case in our General Assemblies, and thus will it be until the laboring men of this great State become educated to the fact that they should appoint committees to wait on the candidates when they announce themselves for the offices of State Senators and Representatives, and convince themselves that the candidate is the proper person to represent the people, and if not to lay away all political affiliations and nominate and elect men that will really represent the people. And, brothers, now is the time to get in on the ground floor, as there will soon again be Representatives to be elected in every county in the State; and also twenty-five Senators.

Now, brothers, let us try and have our share of these men, and let them come from amongst the rank and file, and not be selected from amongst company men and corporation lawyers. The lawyers are all right, but not the corporation lawyer—as your legislative representatives are in a position to know whereof they speak on this point.

Our Foes.

We wish to call your especial attention to a few of the Senators and Representatives who improved every opportunity to show their antagonistic feelings towards labor organizations by speaking against our bills and otherwise obstructing their passage in every way possible.

SENATORS.

Gonnerman, of Gibson and Posey.
Hanna, of Montgomery and Parke.
Springer, of Bartholomew and Decatur.
Wood, of Benton and Tippecanoe.

Last, but not least,
Mattingly, of Daviess and Pike.

Senator Mattingly took advantage of every opportunity to block labor legislation, and especially the bell-ringer bill, even up to the last day of the session.

The railroad organizations at Washington, Ind., should ever be on their guard, and should Mr. Mattingly ever have any further political aspirations kindly remember him in the same way that he did the bill-ringer bill. Defeat him.

REPRESENTATIVES.

The following Representatives should be remembered as enemies by the laboring men of Indiana should they ever aspire for any political office in the future:

Beaver, of Marion County.
Clore, of Johnson.
Elliott, of St. Joseph.
Fitch, of Delaware.
Furnas, of Randolph.
Garrard, of Knox.
Gifford, of Franklin and Union.
Grieger, of Porter and Laporte.
Hauck, of Dearborn.
Maddox, of Blackford and Grant.
Meek, of Decatur.
Miller, of Starke, St. Joseph and Pulaski.
Racey, of Knox, Gibson and Vanderburgh.
Smith, of Jay.
Stephens, of Madison.
Switzer, of Benton and Warren.
Talbott, of Martin and Orange.
Wickey, of Lake.

The limit was reached by Representative Haggard, of Tippecanoe County, who took the floor in opposition to the co-employers' liability bill and stated that *he did not object to going on record* as he did not cater to organized labor. Brothers, when it is your inning, and you are at the bat, just see if you can not score a home run on some of these gentlemen.

Our Friends.

Brothers, the following list of Senators and Representatives should always have a warm spot in the hearts of the laboring men of Indiana, as their records show in the Sixty-sixth General Assembly that they were the laboring man's friend.

SENATORS.

Beal, of Vigo.
Benz, of Crawford, Perry and Dubois.
Bingham, of St. Joseph.
Clark, of Marion.
Durre, of Vanderburgh.
Farrell, of Marion.
Fleming, of Allen and Adams.
Grube, of Kosciusko and Marshall.
Harlan, of Marion.
Hawkins, of Jay and Randolph.
Kirkman, of Wayne and Union.
Kistler, of Cass and Pulaski.
Lambert, of Delaware.
Long, of Brown, Jackson and Washington.
McCallum, of Jefferson, Ripley and Switzerland.
McCarty, of Clinton and Carroll.
McCullough, of Madison.
McDowell, of Knox and Sullivan.
Parks, of Clark, Scott and Jennings.
Patterson, of Franklin, Dearborn and Ohio.
Pelzer, of Vanderburgh, Spencer and Warrick.
Powers, of Dekalb and Steuben.
Proctor, of Elkhart.
Ranke, of Allen.
Royse, of Clay and Vigo.
Shafer, of Grant, Blackford and Wells.
Stotsenberg, of Floyd and Harrison.
Tilden, of Marion, Morgan and Putnam.
Yarling, of Johnson and Shelby.

REPRESENTATIVES.

Askren, of Harrison.
Babcock, of Lagrange and Steuben.
Bassett, of Marion.
Behymer, of Madison.
Brolley, of Jennings and Scott.
Beunnagel, of Marion.
Carter, of Hendricks.
Chrisney, of Spencer.
Coahran, of Madison.
Coble, of Pike and Dubois.
Davis, of Carroll, Howard and Miami.
Demberger, of Posey.
Douglass, of Switzerland and Ohio.
Durham, of Sullivan.
Eschbach, of Kosicusko.
Faris, of Lawrence.
Faulknor, of Laporte.
Foor, of Vigo.
Galbraith, of Ripley.
Gauss, of Marion.
Gemmill, of Grant.
Gottschalk, of Adams.
Harris, of Monroe and Brown.
Hay, of Vigo.
Hewig, of Vanderburgh.
Hill, of Bartholomew.
Honan, of Jackson.
Kayser, of Clay.
Kessler, of Miami.
King, of Wabash.
Kleckner, of Cass.
Kliver, of Lake and Newton.
McGinnis, of Morgan.
McKennan, of Dekalb.
Mendenhall, of Hamilton.
Merriman, of Wells.
Mitchell, of Clark and Washington.
Moss, of Greene.
Mugg, of Clay and Owen.
Ratliff, of Wayne.
Rentschler, of Fulton and Cass.
Rodibaugh, of Elkhart.
Roggen, of Allen.
Schreeder, of Vanderburgh.
Shafer, of St. Joseph.
Shirley, of Allen.
Stevens, of Gibson.
Stewart, of Howard.
Strickland, of Hancock.
Sunkel, of Vigo and Vermillion.
Sweeney, of Crawford and Perry.
Thornton, of Floyd.
Tomlinson, of Shelby.
Wagner, of Clark.
Wasmuth, of Huntington.
Watson, of Hamilton and Tipton.
Wells, of Allen.
Wise, of Marshall.
Wider, of Elkhart.
Williams, of Warrick.

We wish also to speak of the friendly and courteous treatment extended to all Labor Legislative Boards by the President of the Senate, Lieutenant-Governor Mr. Frank J. Hall, the Speaker of the House, Mr. Thomas Honan, the Principal Clerk of the House, Mr. J. W. Vizard, and Col. W. W. Huffman, Secretary of the Senate.

Our Co-Workers.

It affords us great pleasure to be able to state that organized labor in general was ably represented during the sessions of the General Assembly.

Your Board has found it a great pleasure to work with such men as the members of the Trainmen's Legislative Board, Bro. F. L. Feick, chairman; E. L. Rankins, vice-chairman, and W. C. Prosser, secretary-treasurer. Also with Brothers Perkins and Gaumer, of the State Federation of Labor, and Brothers Lackey and Pierce, of the United Mine Workers, as they are all men of ability, honest and sincere and in every way true to the men they have the honor to represent.

We will say that the Brotherhood of Railroad Trainmen, State Federation of Labor, United Mine Workers and the Brotherhood of Locomotive Firemen and Enginemen worked co-operatively throughout the entire session.

On January 14 your chairman, with the chairman and secretary of the B. of L. E., W. T. Brown of the O. R. C., and E. L. Rankins, vice-chairman of the B. of R. T., called on the State Railroad Commission in reference to several matters of interest to the railroad men of the State. Among the subjects that were brought up were the tunnels on the Southern Railroad, in the southern part of the State, and your chairman was told by the chairman of the Railroad Commission that he would investigate this matter and report same back to the chairman of your Board, but up to the present time your chairman has received no report from the Railroad Commission.

In conclusion, let us say to the membership that it has been forcibly demonstrated that it is prejudicial to the cause of organized labor to elect corporation lawyers to legislative bodies. Our men should choose men from amongst their own members, who will better subserve their interests.

JAMES R. MORRISSEY,
Chairman.

Attest:
WILLIAM E. TRIPPEER,
Secretary-Treasurer.

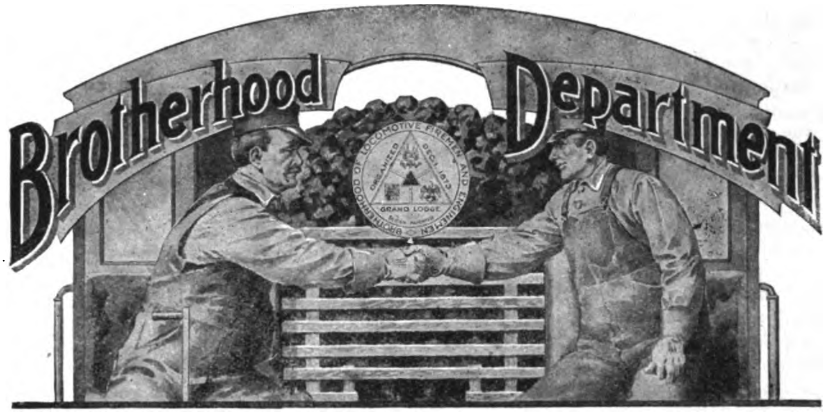
◆ ◆ ◆ ◆ ◆

THAT GARNISHEE LAW OF TEXAS

I have read with much interest the different articles in our Magazine in regard to the garnishee law, and I want to say right here that no just and honest brother will ever be given any trouble at the hands of merchants if he shows any willingness to pay his honest debts. Some deadbeat may come up to a younger member and tell him a long story and he will take it all in without first investigating the facts in the case. When a brother has not the actual cash to meet his accounts that are due, I would say go to your creditor and tell him the truth at the proper time and he surely will wait longer, but do not dodge him and begin to trade some other place and pay cash, as this is what brings on trouble. I say equal justice to all.

Now, brothers, when pay day comes and your check shows up short and your hard earnings are withheld, do you try to collect the balance due or just donate it to the company? You positively do no such thing; you want your money and you are not slow in taking the necessary steps to get it, and you are certainly right in doing so. You earned it honestly and it is just and right that you should receive it. The banker has laws to protect his interests and to collect his accounts where it is necessary, and the wholesale houses have all sorts of ways to force the collection of money due them, but the retail merchant in most cases is left out entirely without any redress. Is this justice to all? I leave it for you to decide. The retail merchant must have some sort of protection or he will be forced to discontinue the credit business. Now, Texas laws say the deadbeat does not have to pay his honest debts, and if he does not feel like it he can decline to do so. If the John Brown Grocery Company sells all the boys on credit who ask for it to the amount of $5,000 worth of goods, to all classes of men, and loses $2,000 in bad debts, and Jones & Company sells strictly for cash and loses nothing, where can you buy the cheapest —at Brown's or at Jones's?

C. C. TABER.



LET US COMPLETE THE WORK OF ORGANIZATION

There is at the present time nothing more important to our Brotherhood and each of its individual members than complete success in our work of organization. Too long have the men of our order been bearing all the burdens incidental to the protection of the industrial interests of non-Brotherhood men in railroad engine service. It is neither fair nor right that they should continue longer to do so. Were it not for the Brotherhood the employment conditions under which the non-Brotherhood man is working would be vastly inferior to what they are. His wages would be very materially less and he would find his position decidedly more disagreeable in many particulars than it is today.

Indifference and Selfishness.

There are two main causes which are responsible for the fact that on nearly every system many men of our occupation are at present to be found outside the ranks of our Brotherhood, although having served as locomotive men the full period prescribed by the constitution as requisite to membership—some of them much longer. These causes are indifference and selfishness. It is safe to say that fully 90 per cent. of the unorganized engineers, firemen and hostlers of the continent continue to be non-Brotherhood men purely because of indifference. Many of these men live from day to day fully intent on becoming Brotherhood men—"some time." They mean well, but are simply careless. Of the other 10 per cent. a majority prefer to remain non-union men either because they wish to avoid the slight expense incident to joining the Brotherhood or imagine that they will stand better with the officials of the company employing them by keeping aloof from the organization that protects their industrial interests—to the work of which they owe so much and from which they are deriving such great benefit. Such fellows are unworthy of serious consideration,. and it is not the object of this reference to waste any time or space in discussing them—it is to the men who are merely "indifferent" that we desire at this time to give our attention.

All that is needed for the organization of the "indifferent" non-Brotherhood men is missionary work of the right kind. If each lodge will do its part in conducting a campaign for the complete organization of the men within its jurisdiction and will carry on this work along the most effective lines it will be but a matter of a comparatively short time until there will be no non-Brotherhood enginemen left on the continent except such as we would not care to admit to membership—those who, from a standpoint of character and principle are ineligible and whose identity as nonunion men would, therefore, be a standing stigma upon them.

Results Accomplished—"Go Ye and Do Likewise."

A striking demonstration of what can be accomplished along this line has recently been given by Lodge 543. A contribution from Bro. Joseph Coots appearing in the Forum Department of this issue under the title "A Plan to Swell Our Membership," etc., gives a most interesting account of how that lodge went about this work and of the results it has accomplished. It made the task of organizing all the non-Brotherhood men who were eligible to membership within its jurisdiction a "special order of business," and instituted a regular organizing campaign which it conducted systematically and vigorously. The first step taken was to prepare circulars for distribution amongst non-Brotherhood men. These circulars explained what the Brotherhood had accomplished in the interests of men of our occupation generally. They impressed on each man receiving one that he was enjoying great advantages as a result of the work of the order. They appealed to his manhood and principle to join in helping to push that work forward and by contributing his aid, both moral and financial, to do his part in accomplishing still greater things for the men of his occupation. As a result in the short period of four or five weeks 61 candidates have been initiated—each and every one of them being employed on lines of railroad within the jurisdiction of that lodge. Today these men are contributing both morally and financially to the great work of our Brotherhood. In consequence of this united and determined effort on the part of Lodge 543 they are now within the fold standing shoulder to shoulder with their fellow employes in the ranks of our great industrial army—sworn to advance our common interests and to uphold, defend and assist in propagating the glorious principles of Protection, Charity, Sobriety and Industry with which our banner is inscribed. Were it not for the special effort put forth by this particular lodge these men would still be numbered amongst the unorganized—an obstacle to the success of our Brotherhood at all times, but particularly (because of the uncertainty of their position) in the event of its becoming involved in a fight to enforce fair conditions on the system where they are employed.

There are many other lodges that have accomplished great results in this direction. It is doubtful, however, that any such results have ever been more directly or more speedily the consequences of a carefully planned and vigorously executed campaign of organization such as was instituted by the lodge in question. To the "missionary" methods adopted by Lodge 543, and particularly to the use of the circular, is attributable the fact that 61 of its members who but a few weeks ago wert classifiable as "indifferent non-Brotherhood men" are now within its ranks. If the same tactics are adopted by every lodge in our Brotherhood there is no good reason why our membership should not easily reach the numerical standard of ninety thousand to which we are striving to attain for the St. Paul convention.

Conditions in the South.

Especially in the South will it be necessary for our brothers to become active and determined in the work of organization because they have obstacles to overcome which do not exist in other parts of the continent. This fact was so thoroughly recognized by our last convention that a special organizer in the person of Bro. W. W. Slaby was appointed to assist in organizing the non-Brotherhood men eligible to membership in that section.

In a contribution appearing in the Forum Department of this issue under the title "An Appeal on Behalf of the South," obstacles are clearly set forth with which our Southern brothers are having to contend in their efforts to bring our Brotherhood up to a proper standard of organization in that part of the country. Probably the greatest of these obstacles is the "negro fireman" —one which is mainly responsible for the fact that Brother Gaston (the writer of the contribution referred to) on leaving Illinois to engage in locomotive service in Mississippi found such a defective condition of organization in that state. Bro. Gaston's contribution reflects the confidence reposed in Bro. Slaby by all who know him. It is, therefore, to be hoped that our brothers of the South will put forth special efforts and, earnestly cooperating with Bro. Slaby, speedily reduce to the greatest possible minimum the number of non-Brotherhood men amongst them who are eligible to join our Order.

Winnipeg Grand Union Meeting.

The brothers in charge of the arrangements for the Canadian Grand Union Meeting to be held in the city of Winnipeg on August 3d, 4th, 5th and 6th next, are leaving nothing undone to make that event a grand success.

It is doubtful that any city on the continent has ever had such a substantial and at the same time such a speedy growth as Winnipeg. The trading and commercial center of a new country, it has been nourished by all of the resources of a vast fertile virgin territory. In and about this city progress is everywhere evident and health and education flourish. Winnipeg is not a city of that cheap or temporary construction that is largely characteristic of frontier towns, but on the contrary the maintenance of the best modern standards has marked its physical development. In its civic and industrial structure there is no factor that is more firmly implanted than organized labor, and no interest that is more generally recognized and respected than the rights of the wage-earner.

The Canadian Grand Union Meeting which is to be held in this great metropolis of the vast Canadian Northwest, constitutes an opportunity for our members and their families to visit, under the most pleasant and auspicious conditions, a city which, for progress and enterprise, is excelled by none in the world.

Of Winnipeg it has been truly said it is indeed a "remarkable city," and relative to its growth and progress an authentic writer is authority for the following facts:

"The last official census, taken in April, 1909, puts the population at 130,000 souls within the city limits. In 1870 Winnipeg had a population of 215, and was a frontier trading post of the Hudson's Bay Company. Thus, in 37 years the place has grown at a rate that was perhaps never surpassed by any city of such substantial character as is a marked feature of the Gateway City of the Canadian Northwest.

"Mining camps there have been that grew up in a few days, or weeks, and cities that have been marked by mushroom development have lapsed into stagnation and business decay. On the contrary, Winnipeg stands at the very opening of its career, and remarkable as has been its progress and growth from the tiny trading post to the full grown and well equipped city, yet greater things lie before it and show clearly on the near horizon of Winnipeg's future.

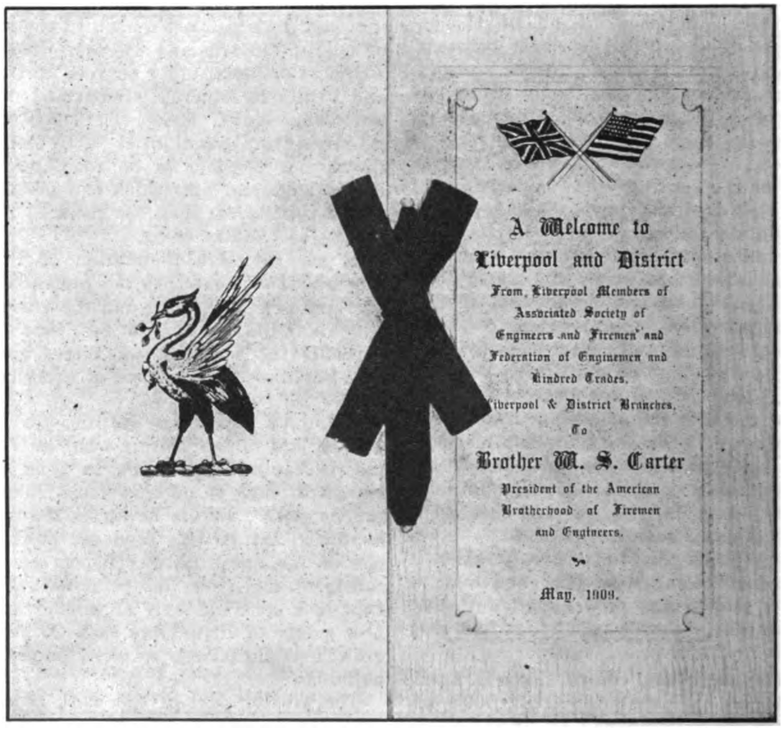
"The reason for this lies in the fact that the wonderful Winnipeg which has grown up on the Manitoba prairie has for the basis of its growth, the solid foundation of agricultural resources beyond the dreams of agricultural avarice. Millions of acres of wheat land which produces the highest average crop of any in the world, and of quality unsurpassed; other millions of acres of excellent grazing land, to which are added, in the case of nearby Ontario and the more distant British Columbia, other sources of trade and wealth in minerals, timber and fruit producing lands, make the trade and manufacturing possibilities of Winnipeg things not possible to be computed by cold calculation, but which can no more fail of being great than can the seed time and harvest fail of being.

"Upon the sure foundation of these substantial elements has the present city of Winnipeg been built, and the traveler who visits the city for the first time sees not only the 'substance of things hoped for,' but also 'the evidence of things not seen.'"

Winnipeg proves a surprise to the greater part of the visitors who reach the prairie capital from time to time and expect to find it nothing more than a prairie town. Before he leaves the train he finds that he has been set down in one of the finest railway depots on the continent, and from this point he will be kept in a constant state of wonder as to how a city of little more than 20 years' growth should possess so many handsome buildings.

The greater part of the work of constructing a modern city where once the prairie rolled in unbroken waves into the far distance, has been accomplished in the last six or seven years, during which time the original buildings that represented Winnipeg in its early days have been torn down to give place to structures of architectural beauty and massive strength. Where once stood a small building, natural to a frontier town, the Union Bank building of ten stories rears its crest to the clouds, serving as a landmark for the traveler approaching Winnipeg. The change has taken place not only in the business sections of the city, but in the residential portion as well, which, with its beautiful shade trees and green boulevards, offers a welcome change from the ordinary city with its paved roads and footways and bare of every vestige of tree or grass.

In addition to the beauty of Winnipeg as a city, the visitors to the Canadian Grand Union Meeting will also enjoy the hospitality of as true, as sturdy, and warm-hearted a body of Brotherhood men as ever swore allegiance to the principles of organized labor, and to whom the greatest pleasure to be derived from the event will be that of making all who attend the meeting happy while in their midst.



A Welcome to
Liverpool and District
From, Liverpool Members of
Associated Society of
Engineers and Firemen and
Federation of Enginemen and
Kindred Trades.
iverpool & District Branches,
To
Brother W. S. Carter
President of the American
Brotherhood of Firemen
and Engineers.

May. 1909.

Reduced reproduction of Four-Page Announcement of Formal Welcome and Reception to Brother W. S. Carter in Great Britain—Front and Back Covers

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President Carter Has Reached Great Britain.

President Carter sailed on the Mauretania for Great Britain on May 5th, to attend a conference of the Associated Society of Locomotive Engineers and Firemen. He sailed on one of the two recently built steamers of the Cunard Line, the fastest now on the ocean, and in carrying the president of our Brotherhood to the old country the Mauretania characterized the event by beating her own previous and all other eastward records by 24 minutes. Cable dispatch from Queenstown, Ireland, says:

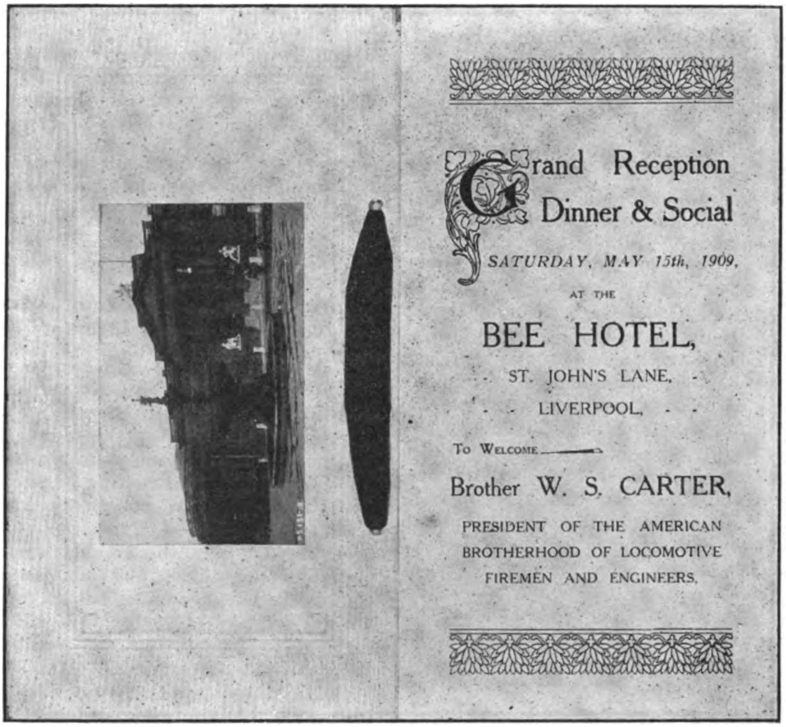
May 10.—The Cunard line steamer Mauretania arrived off Daunt's Rock at 10:48 this morning, having beaten her own previous and all other eastward records by twenty-four minutes. She would have done still better had she not been delayed by fog off Fastnet. The liner's time from the Ambrise lightship to Daunt's Rock was 4 days 18 hours 11 minutes. She covered the entire distance, 2,935 knots, at an average speed of 25.70 knots an hour.

That our British brothers propose to make President Carter's visit an event that he will long remember is evidenced by the preparations made by them to give him a rousing and hearty welcome to their country's shores, as evidenced by the program showing the arrangements made for the welcome and reception of Brother Carter upon his arrival, reduced reproductions of which are shown herewith.

* * *

Back Copies of the Magazine Desired by the University of Minnesota.

The Magazine office is in receipt of a letter from James Thayer Gerould, Librarian, The University of Minnesota, Minneapolis, Minn., in which he states that their library is in need of the following numbers of the Magazine to complete their files: October and December, 1902; January, February, April, June, August and December, 1903; January and September, 1904; June, July and September, 1905; June and July, 1906, and February, April, July, September, October and December, 1907. Any one in possession of these back copies or any number thereof, and willing to dispose of same, should correspond with Mr. Gerould at the above address.


Grand Reception
Dinner & Social
SATURDAY, MAY 15th, 1909,
AT THE
BEE HOTEL,
ST. JOHN'S LANE,
LIVERPOOL,
To Welcome
Brother W. S. CARTER,
PRESIDENT OF THE AMERICAN
BROTHERHOOD OF LOCOMOTIVE
FIREMEN AND ENGINEERS.

Reduced reproduction of Four-Page Announcement of Formal Welcome and Reception to Brother W. S. Carter in Great Britain—Two Inside Pages

* * *

O. R. C., B. of R. T. and O. R. T. Conventions in Session.

As the Magazine goes to press the Biennial Convention of the Order of Railway Conductors is in session at Boston, Mass.; the Brotherhood of Railroad Trainmen at Columbus, Ohio, and the Order of Railroad Telegraphers at Atlanta, Ga. The Magazine extends to all three organizations the sincere wish that their conventions now in session may result most beneficially to each.

* * *

Discuss It at Lodge Meetings.

The matter of helping the Hatters in their present struggle and of standing by the Shoe Workers' Union should be brought up and discussed in all of our lodges. Elsewhere in this issue is published a set of resolutions adopted by Lodge 35, which certainly evidences the right spirit and expresses the sentiment entertained by every true Brotherhood man. By bringing this important matter up in lodge meetings for general discussion and consideration, much better and more effective results can be produced.

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Shandy Maguire (Brother Fennell) Sails for the United Kingdom.

Brother Shandy Maguire (Patrick Fennell) has started on his trip to the United Kingdom. He sailed from New York on May 1st. Shandy chose the steamer bearing Scotland's poetic name—the Caledonia—upon which to make the trip eastward. While it is sixty years or more since he left the Little Green Isle of his nativity, or since he has been away from Uncle Sam's domain, he has many friends in the Associated Society of Locomotive Engineers and Firemen with whom he is on almost as familiar terms as though, like Andrew Carnegie and a few others, he had for many years been an annual visitor to Great Britain and Ireland, Brother Fox, General Secretary and Treasurer of the A. S. of L. E. and F., and Brother Spencer, a veteran engineer and member of the Liverpool Branch (lodge), being amongst his many "cronies" across the pond, where his poetry has permanently established his name and reputation. Shandy during his visit to Great Britain will be the guest of the Associated Society of Locomotive Engineers and Firemen, in response to an oft-repeated invitation of many years standing.

A writer in the April number of the Locomotive Journal, the official publication of that organization, refers poetically to Shandy's approaching visit as follows:

Whose poems do we love the best
In all the land from East to West;
Who us with noble thoughts inspire?
"Shandy Maguire."

Who's fought our battles on the road,
And tried to ease the heavy load,
Whose pen for us doth much acquire?
"Shandy Maguire."

Who, when Conventions 'ssemble round,
With ready pen will there be found;
Who is this hero, you inquire?
"Shandy Maguire."

Who when a brother's in distress
Will write of all his "talents" best,
And set officials' hearts on fire?
"Shandy Maguire."

. . . .

Who when the funeral dirges sound
Can pass the news so gently round
It sounds like music from the choir?
"Shandy Maguire."

Who'll write when Shandy's spirit flies,
When in his grave he silent lies?
Whose name will pass from sire to sire?
"Shandy Maguire."

But let us praise him while he's here;
May he live for many and many a year
As happy as we all desire,
"Shandy Maguire."

♣ ♣ ♣

Notice to Brothers Visiting Alaska-Yukon-Pacific Exposition.

The Magazine office is in receipt of a letter from Bro. I. S. Good, recording secretary of Lodge 407, Seattle, Wash., in which he states that the members of that lodge will be pleased to render all assistance possible to visiting members of the Brotherhood in attendance at the Alaska-Yukon-Pacific Exposition to be held in that city the coming summer. He gives the names and addresses, as well as the telephone numbers, of the following members of Lodge 407, who will be glad to render any aid possible if called upon: Brothers J. H. Gilluly, 1504 E. Alder street, Sunset telephone, East 1228; Joseph Bertusky, 1027 King street, Sunset telephone, Main 2844; Vermont Little, 3047 16th avenue West, Sunset telephone, Queen Ann 2983; Wm. E. Stover, 1227 Terrace Court, Sunset telephone, East 4218; I. S. Good, 1303 Yesler Way, Sunset telephone, East 3965.

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Sparks.

Unless every member is willing to "shoulder" his share of the work of organization we will not go into St. Paul 90,000 strong.

A trip that offers much in the way of sightseeing and profitable and pleasing entertainment is the Winnipeg Grand Union Meeting which will be held on the 3d, 4th, 5th and 6th of August next. Brothers, you will miss "half your life" if you do not attend.

The Magazine office is very anxious to procure copies of the Directory as follows: Fourth quarter of 1904; the second half of 1906 and the first half of 1907. Any one in possession of the above named copies of the Directory will please correspond with John F. McNamee, Editor and Manager, Traction Terminal Building, Indianapolis, Ind.

For information relative to hotel rates, etc., for the coming Grand Union Meeting to be held in Winnipeg, Man., on August 3d, 4th, 5th and 6th next, apply to Geo. F. Collings, secretary of the Arrangements Committee, 23 Empress Block, Main street, Winnipeg, Man. Bro. Collings will gladly furnish any information desired.

Bro. H. G. Peelle has back numbers of the Magazine for the years 1901, 1902, 1903, 1904, 1905, 1906, 1907 and 1908, with but few exceptions, of which he is willing to dispose. Interested parties should correspond with him at the following address, H. G. Peelle, 309 McDonough street, Brooklyn, N. Y.

One of the most important duties before our lodges at the present time is to arrange an organizing campaign for their respective localities.

Our wide-awake and enthusiastic Canadian brothers are knee-deep in the preparations for their Grand Union Meeting which will be held in the city of Winnipeg on August 3d, 4th, 5th and 6th next. A treat is in store for all who are so fortunate as to be in attendance.

The price of a bound volume of the B. of L. F. and E. Magazine for the year 1908 is $2.50, express prepaid, to any part of the United States, Canada or Mexico. It contains a "world of information" from cover to cover, that will prove of inestimable value to the up-to-date railroad man. All remittances should be sent to John F. McNamee, Editor and Manager, Traction Terminal Bldg., Indianapolis, Ind.

Brothers, if you know of a non-Brotherhood man who is eligible to membership in our order, you should not rest until he has taken his place in the ranks of the old "Tried and True."

For full particulars regarding the Canadian Grand Union Meeting to be held on August 3d, 4th, 5th and 6th next, write to Brother G. F. Collings, secretary of the meeting, 23 Empress Blk., Main street, Winnipeg, Man.

FROM THE PRESIDENT

Laws Governing the Protective Department

The great number of questions asked makes it evident that the laws governing the Protective Department of the Brotherhood are not understood—even by those directly connected with Joint Protective Board work.

The following information is presented for the benefit of Protective Boards, with hopes that it will assist in reducing expenses of protective work:

"Any member considering that he has been unjustly dealt with by his employer, or, that he is otherwise aggrieved, shall report the same in writing at a meeting of the lodge having jurisdiction, and if deemed a proper subject for investigation, the matter shall be referred to the Protective Board, provided the lodge may authorize the Protective Board to adjust grievances pertaining to rights specified by contract or agreement with the company without having first been referred to the lodge; and in such cases a member may submit his grievance to the chairman of the local board."

The foregoing is the exact language of Section 209 of our Constitution and yet many questions are asked concerning this matter that are plainly answered in this section of our laws. It seems that on some systems of railway, the general chairman is expected to take the places of lodges and local Protective Boards, relieving them of all work in connection with the Protective Department. Some complaints indicate that neither the lodge nor the local Protective Board will give consideration to the personal troubles of members, expecting him to refer his case direct to the general chairman.

When a grievance is presented as provided in Section 209, "it shall be the duty of the local Protective Board, when so directed by the lodge to carefully examine into all complaints of members concerning their rights as employes on the road on which they are engaged and to use all honorable means to amicably adjust all such grievances as may exist between members and the officials of the road. In their efforts to adjust grievances the board shall first present them to the officials having immediate charge of the department in which the member is employed and who may have jurisdiction in the premises. In the event of their failure to effect a settlement of the grievance with such official, they may appeal to the highest division official, and if not successful in adjusting the grievances with him, they may call upon the chairman of the Joint Protective Board to assist them in bringing the matters in dispute to a satisfactory settlement."

The foregoing is the language of section 202, yet many questions are asked as to how local boards should handle grievances.

"Should the local board fail to satisfactorily adjust any grievance presented to it as provided in the foregoing section (section 202) and if the lodge so orders it, the recording secretary of the lodge shall send a certified copy of the grievance to the chairman of the Joint Board, upon receipt of which he shall arrange a meeting with the general officers of the company and may summon the chairman of the local board of the lodge where the grievance exists to meet with him and the general officers of the company at such time and place as may be designated. Should the chairman of a Joint Protective Board be unable to adjust the grievance with the general officers of the company, the Joint Protective Board may be convened."

The foregoing is the exact language of section 210 and section 212 says: "It shall be the duty of the Joint Protective Board to carefully and impartially investigate all complaints legally referred to them for adjustment, and when the justice of the complaint is determined, the board shall proceed to adjust the same with the general officials of the road, using all honorable means to secure a peaceful and satisfactory settlement of the matter in controversy. When all honorable means have been exhausted and no settlement reached, the board shall, through their chairman and secretary, call upon the international President to come to their assistance." Section 213 says that: "In the event of a Joint Protective Board failing to adjust a grievance, the chairman and secretary shall prepare a statement of the grievances and forward the same to the international President. Should it become necessary for the international President to be present with the Joint Protective Board at the meeting with the officers of the company, the chairman shall use due diligence to have the time of meeting arranged, as far as possible, to serve the convenience of all persons interested."

Evidently it is the intention of our laws that the President or a Vice-President is not to interfere between the employes and officials of a company, until all of the foregoing provisions are complied with by the Joint Protective Board.

It is a serious mistake for a Grand Officer of the Brotherhood to be brought into a dispute between the officers and employes of a company until such time as it is known that it cannot be settled amicably by the officers and employes. Grand Officers of the Brotherhood should not lay themselves liable to accusations of "agitating trouble."

Judge Adams issued his famous "Wabash Injunction" upon the pretense that there was no trouble between the company and its employes, except such as had been incited by persons not in the employment of the company. Of course, the judge dissolved his injunction when he found that the trouble was not instigated by outsiders, but the first understanding of the court shows the inadvisability of Joint Protective Boards attempting to transfer their work to the Grand Lodge officers, before they have complied with the laws of the Brotherhood.

Under no circumstances should Joint Protective Boards seek to avoid the responsibility of failing to adjust a personal grievance of a member by attempting to transfer such responsibility to a Vice-President. If a board is not able to secure an adjustment, and there is no thought of polling the members for a strike, why should the influence of Grand Lodge Officers be weakened by calling them into what all must know is a "lost cause?"

As the laws now seem to be construed by some, it would require many Vice-Presidents to respond to all calls for help. If Joint Boards only called for the assistance of Grand Officers as contemplated in our laws, and only when they knew it to be necessary, much organizing work could be done by such officers.

The demands for assistance of Grand Officers has become so great that little or no time is left for visiting lodges. The last Convention recognized the necessity of placing a special organizer in the Southeastern States, and organizers for other sections of the country are now proposed by correspondents.

The best evidence that this practice is more a "habit" than a necessity is the fact that on some of the largest systems in the country, a Grand Officer is seldom or never called upon to help adjust grievances. If most of the roads were handled in this manner, at least three organizers could be constantly at work and we could look forward to an increase in membership.

Section 200 provides for the maintenance of the Protective Department of the Brotherhood, and section 201 describes how chairmen of local boards are elected. Section 203 says that: "The chairman of each Local Board shall be a member of the Joint Protective Board upon the line or lines of railway upon which he is employed; he shall attend each meeting of the Joint Board and be entitled to a voice and vote upon all questions that may come before the board for consideration. The Joint Protective Board may meet annually or biennially at such time and place as may have been determined upon at a preceding meeting, and elect from their members, or the members they represent, a chairman, vice-chairman and secretary and treasurer. When properly organized, the board may, by a majority vote of the members present, delegate its authority to a sub-committee of such a number as may be determined upon, such sub-committee to be empowered to act in the full capacity of the Joint Board in the completion of the work referred to them by the full Board. The Joint Board or sub-committee when so empowered shall have the authority to make and enter into with the officials of the company by whom employed, such rules, regulations and agreements as they may deem just and equitable, provided they have been adopted by a two-thirds vote of a Joint Board or the sub-committee has obtained consent from two-thirds of the lodges represented on the system. They shall also have power to enter into contracts concerning the rate of wages, arrange rules respecting seniority rights, adjust grievances, and do all other necessary things on behalf of their members, respecting their work and duties in the service of the company. All rules, regulations, contracts and agreements, so agreed upon by the officials of the railway company and the Joint Protective Board or its representatives shall be binding on all members on said lines of the company within the jurisdiction of the Joint Protective Board."

Section 206 also provides that "The Joint Board when so organized, shall have power to adopt and issue such by-laws for the government and regulation of their system affairs as they may deem best suited to their interests not in conflict with the Constitution and subject to the approval of the international President."

On some of the larger systems, where to convene the entire board occasions great expense, the "sub-committees" provided for in section 203 have been "empowered to act in the full capacity of the Joint Board." Some boards term these sub-committees as "Executive Boards," some as "Advisory Committees," but all are in fact sub-committees of the entire Joint Board.

On some of the larger systems, where much of the time of the general chairman is taken up in joint board work, such chairmen have been granted indefinite leaves of absence by the companies and their entire time is devoted to the work of the board. While no especial provision is made for the duties of "salaried" chairmen in the laws, their duties are the same as any other general chairman. Where such general chairmen are able to successfully conduct the business of their boards without the expense to members of special meetings of their boards and without much assistance of Grand Lodge officers, their "salaries" are among the best investments of the Brotherhood.

Section 207 says that "It shall be the duty of the chairman of the Joint Protective Board to preside at all meetings of the board, to preserve order, cast the deciding vote in case of a tie and perform such other duties as may be required of him during the time the board is not in session. He shall promptly attend to all complaints sent to him from local Protective Boards of subordinate lodges, use due diligence in bringing any controversy that may arise between the members of the order and the officials of the railroad company to a satisfactory settlement. Should he from any cause be unable to perform his duty, he shall immediately notify the vice-chairman, and should the vice-chairman be unable to attend, the international President shall be notified."

The fact that a general chairman is paid a regular salary does not relieve him of the duty of seeing that the laws of the Protective Department are complied with before he acts. No chairman should ignore the prerogatives of his board by proceeding with a grievance to the breaking point without first consulting with his board. If the system is large the sub-committee should be consulted. It is not advisable for a salaried chairman or a Grand Lodge officer (or the two together) to assume the responsibility of "polling" a road for a strike. Before such an extreme stage is reached the sub-committee of the board should at least be convened.

It is probably not contemplated by our laws that a Grand Lodge officer should be called in until after the chairman and his board or the sub-committee of his board have first carried out their duties plainly prescribed in the sections herein quoted.

The purpose of this circular is to promote system and method in handling grievances, and to relieve the Grand Lodge of handling matters that should be handled by Joint Protective Boards. If this purpose is accomplished much time of Grand Lodge officers will be devoted to organizing the unorganized firemen that are so plentiful on many lines of railway. A great reduction in Joint Protective Board assessments may be made by conforming strictly to the law, by reducing all boards to sub-committees as soon as possible, and in requiring all lodges to carefully investigate the merits of all grievances presented before referring them to the boards.

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FROM THE GENERAL SECRETARY AND TREASURER

Funeral Fund Non-Beneficiary Members.

On March 1st a circular letter was forwarded to the home address of all non-beneficiary members setting forth the action of the Eleventh Biennial Convention regarding the establishing of a funeral fund for members who, on account of some physical ailment at the time of joining the organization, were not permitted to participate in the beneficiary department.

The circular letter set forth what the cost to members would be provided this fund was established. Attached to the circular letter was a ballot on which members were to record their vote for or against the creating of this fund, and the letter especially set forth *that ballots received at Grand Lodge office after May 1st would not be counted.*

There were 1,074 letters with ballots attached sent out, and up to May 1st, the time set for ballots to be at the Grand Lodge office, there had been returned to this office but 355 of these ballots, and of this number 43 were returned by the postmasters, as they could not deliver the letters. This left but 312 ballots actually returned, the vote on the same being as follows:

For	283
Against	27
Blank	2
Total	312

There being 1,074 ballots sent out to be voted upon, it will readily be seen that less than one-third of the members entitled to vote cast their ballots either for or against this matter.

It is generally understood in matters of this kind that those who did not vote can be considered as not being in favor of the proposition submitted to be voted upon.

There being such a small number who took interest enough to vote either for or against the creating of this fund, it has been decided by the President and General Secretary and Treasurer not to attempt to have such fund established.

Assessments for Readmitted Members.

It frequently occurs that financial secretaries report to the treasurer that one or more members are expelled for nonpayment of assessments, and before the treasurer makes his returns to the Grand Lodge he is informed that the member or members have paid and he forwards the assessment for said member or members. *This should not be done.* When a financial secretary reports to the General Secretary and Treasurer and treasurer of the lodge a member expelled for nonpayment of assessments this member cannot be readmitted until application is made to the General Secretary and Treasurer on the prescribed form, and said member is not readmitted until the records are made in the Grand Lodge office, at which time the financial secretary is advised of such readmission. No money can be accepted for an expelled member until he has been readmitted as provided in Section 190 of the Constitution. Treasurers should not forward any money for members who have been expelled until same has been called for by the Grand Lodge office, which will be on the statements for the following month.

Increase and Decrease of Beneficiary Certificates.

Section 168 provides how beneficiary certificates can be increased and decreased. In both cases it is necessary for the member to give his old certificate to the recording secretary of his lodge to be forwarded to the Grand Lodge for cancellation.

Many applications for decrease are received at this office and no old certificate accompanies the application. The same also applies to applications for increase. Members should, when making application for increase or decrease, be sure to hand to or see that their old certificate reaches the recording secretary, and the recording secretary should not forward an application for increase or decrease to this office unless the same is accompanied by the member's beneficiary certificate, and in case of an application for increase it must be accompanied by an application for beneficiary certificate in the prescribed form—the same as is used when making application for membership. *This medical examination must be made in the month in which application for increase is made.*

Reports of Final Withdrawal Cards.

Some recording secretaries fail to report to this office the names of members who have been granted a final withdrawal card. The treasurer, however, is advised of the withdrawal, and in making his returns to this office fails to remit for said member or members, but on the statement says that they have withdrawn. No official notice of a final withdrawal card can be accepted at this office unless it comes from the *recording secretary*, as he is the only one under the law who is authorized to make such report to the Grand Lodge office. This office will, however, accept notice of final withdrawal card on the statement sent in by the treasurer with his returns, providing the office of *recording secretary and treasurer* are held by the same member, but on the page for reporting final withdrawals the officer should sign his name as *recording secretary and treasurer*. If this latter is done it will assist this office very much and at the same time relieve the officer of sending in two reports.

Reports of Expulsions for Nonpayment of Assessments.

While two months have passed in which assessments have been collected monthly, at this writing this office has only had one month of returns and reports. We have experienced considerable trouble in having financial secretaries make reports of expulsions and have the same reach this office before the treasurer sends in his returns. With quite a number of lodges the treasurers have sent in their returns and reported certain members expelled, but no report has been received from the financial secretary, and consequently the returns have to be held and the treasurer advised that we have no official report of the expulsion of the members. Perhaps within the next day or two along comes the report from the financial secretary, at which time the returns can be released. Yet at the same time the notice has been sent to the treasurer, who in turn calls upon the financial secretary and then learns that the report has been sent in. This causes work for the treasurer which could be obviated had the financial secretary sent in his report of expulsions on the second or third day of the month. We have prepared a book, "Form S-18," the cost of which is 35 cents. If every financial secretary would secure one of these books, which are so made that three copies can be made at one time, it would be an easy matter to write the names of the members who have failed to pay their assessments on or before the first day of the month and forward one copy to the Grand Lodge office at once. It would reach this office from the most distant point not later than the 6th or 7th of the month; the expulsions would be recorded and when the returns of the treasurer are received they could be released at once and a receipt forwarded for the amount remitted. This office urges upon the financial secretaries the necessity of sending in their reports of expulsions early, for in so doing it will not only assist us in handling the treasurer's returns but will at all times keep the affairs of the lodge in the best possible condition.

This office has decided to accept a notice of expulsion and final withdrawal on the same report, provided the offices of *recording secretary and financial secretary* are held by the same person, *but not otherwise.* When this is done the financial secretary should designate on said report which members have been expelled and which have withdrawn. *Be sure to report to the Grand Lodge office all members as expelled that you so report to the treasurer.*

Returns Not Released.

On May 1st there was in the hands of the General Secretary and Treasurer returns of over one hundred (100) lodges which had not been released, and nearly all of them were held awaiting reports from the recording secretary of final withdrawals or from the financial secretaries of expulsions. It will readily be seen why this office is urging the making of reports in time.

Form B-58.

Many complimentary letters have been received relative to this new form and the amount of work it has relieved financial secretaries from performing. This office is pleased to receive these letters of commendation, and it will be our aim to at all times do all that is possible to relieve subordinate lodge officers of any work we can. We believe that if this form is used—and it should be used by financial secretaries—and if one copy is turned over to the treasurer of the lodge, setting forth who have and who have not paid their assessments, there will never be any question of the two offices at all times having their accounts exactly alike.

There may be some mistakes in these forms as regards Joint Protective Board assessments and local lodge assessments. These amounts, however, are such as were received at this office from recording secretaries before these forms were printed. As the forms were printed to last one year, or until January 1, 1910, no changes can be made in them. When the amount is not correct, all that is necessary is to draw a line through this column and use one of the other columns by inserting the right amount.

No Money to Be Returned or Credited to Lodge.

It has occurred many times in the past that a member has been expelled or taken a final withdrawal card but no report of it was sent to the Grand Lodge office, and the treasurer has continued to remit for said member or members. At the expiration of from six months to two years it is discovered that this ex-member has paid nothing into the lodge for a long time, and the lodge writes this office asking that it be given credit for this money, it being stated by the officers of the lodge that the facts are as represented.

Now that assessments are collected monthly there is no occasion for anything of this kind. A member either pays or he does not. If he does not pay he should be reported by the financial secretary to the General Secretary and Treasurer and the treasurer of his lodge, and the treasurer should not remit for him.

The law in the past has been the same as at present. Section 152 provides that financial secretaries shall, when paying money to treasurers, accompany such payment with a list of the names and the amount each member has paid. This law has not been complied with by many lodges, the then collector failing to deliver said list of names and the treasurer not insisting on having same. The collectors simply handed over an amount of money and the treasurers received the same. Sometimes the collector told the treasurer who was expelled and many times he did not. If there was money enough to send to the Grand Lodge office for all members it was done, and the same thing continued for a long time or until there was a change in the office of collector and he discovered that some man had not paid for quite a while and the matter above referred to has taken place. A member was then recorded as expelled or withdrawn that had really been out of the Order months before.

Form B-58, above referred to, was prepared to assist in putting a stop to anything of this kind. By using the form which is forwarded from this office on the 25th day of each month, and which has the names of every member of the lodge who is on the Grand Lodge register on that date, there is no reason why the treasurer should not know just who has paid and who has not, and who to remit for.

In the future if treasurers remit for a member and at a later date this office is advised that said member was expelled or had taken a final withdrawal card some time previous, no credit will be given for moneys claimed to have been forwarded to the Grand Lodge office for said expelled or withdrawn member.

Treasurers' Returns for One Month Have to Be Released Before Any Money for the Next Month Can Be Accepted.

As treasurers now have to remit to the Grand Lodge office each month, no statements will be forwarded to them for the next month unless the preceding month's affairs are entirely cleaned up. If treasurers are notified that not enough money has been received to keep all members in good standing he should at once proceed to forward the amount called for so that his returns can be released. If his returns are held on account of failure of the financial secretary to report expulsions or the recording secretary to report final withdrawals, he should see that these officers make the proper report so as to have his returns released. Should he be advised from this office that either of those officers have failed to make necessary reports, in order to release his returns he should at once see such officer and request him to forward the report.

Bonds of Treasurer and Financial Secretary and Duties of Board of Trustees.

On March 1st the treasurer and financial secretary of every lodge was bonded in a surety company, the premium on said bonds being paid by the Grand Lodge office as provided for in Section 23 of the Constitution. It will be understood that the surety company guarantees the honesty of every one of these officers, and in case one of them should fall by the wayside or fail to remember his obligation it agrees to reimburse the lodge for any pecuniary loss such lodge may sustain by the dishonest acts of any of said officers. The matter of reimbursement to the company for any moneys paid on account of the dishonesty of any of these officers is between the company and the officers.

There is a duty devolving upon the Board of Trustees, and this is a very important duty.

The attention of the Board of Trustees of every lodge is called to Section 155 of the Constitution, and it is sincerely hoped that each individual member of each board will see that he performs the duties required of him in said section. Do not wait for the other fellow, but act for yourself. The writer understands that it is not possible at all times for the three members to meet and examine the books of the financial secretary and treasurer, but if each one of them will examine them when he can he will have performed his duty, and the officers mentioned will be better pleased to know a member of the Board of Trustees has examined his books and found them correct.

The financial secretary and treasurer should make up their reports as soon after the last day of the month as possible and notify the members of the Board of Trustees where the books and reports can be found at any time for examination. Should the trustees not examine them the officer should see that the report is in the lodge room at the first meeting in the month. If possible have your books and accounts there at the same time, as one or more of the members of the Board of Trustees may be in attendance, at which time they can make their examination.

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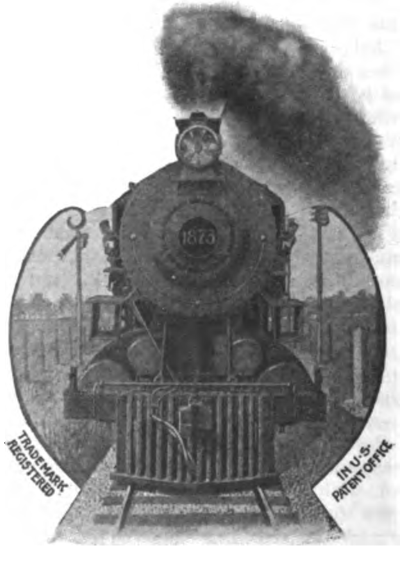

Forum

A Plan to Swell Our Membership—Lodge Work That Counts.

While I fully appreciate the intent and purpose of the laws of our Brotherhood regulating the publication in the Magazine of matters of a purely local nature, I realize that the subject I am about to write on has a most important bearing on the welfare of the Brotherhood in general, as it treats of a plan for successfully carrying out the great work of organization. I am, therefore, confident that it will receive space in the columns of our valuable Magazine and that it will be regarded as in no sense conflicting with the intent of the laws regulating the publication of matters of a "purely social or local nature." When I say that my communication treats of a plan for successfully carrying out the work of organization I want it understood that that plan has been indeed successful, and it is because of its success that I am sending this contribution to the Magazine.

Lodge 543 becoming vividly and unanimously conscious of the fact that within its jurisdiction there were many men of our occupation who were eligible in all particulars to membership in the Brotherhood, who had not yet enlisted under its banner, decided to grapple with the solution of the problem thus presented. That these men should all be enjoying the benefits and advantages which the Brotherhood has secured for those of our calling without contributing in any way, either financially or otherwise, to its support seemed, to say the least, rather unfair. We felt, however, that it would be hardly just or fair to accuse them of wrong motives unless when tested they failed to prove themselves men of principle. We also felt that it would be unfair to the Brotherhood in general and to ourselves as their fellow employes to leave them adrift on the sea of nonunionism without making an effort to gather them into our craft. We accordingly decided to apply the test and to number in our ranks all of them that proved to be real men, so we planned an organizing campaign. The lodge formed itself into a committee of the whole, electing Bro. Ed Monroe as chairman. We first distributed a circular explaining the advantages of membership in our Brotherhood and impressing on non-Brotherhood men the advisability of joining us. This circular was prepared by members of the lodge, and after being printed was presented to and accepted by the lodge. Each member, securing a supply of the ammunition, started out with Bro. Ed. Monroe as general. Every non-Brotherhood man who was eligible was approached, and those who were men lost no time in going to the doctor, and in due course of time we arranged for a succession of meetings which were held March 26, 27 and 28.

At these meetings Assistant President Wilson and Brother Robertson, our general chairman, were present to lend their aid in pushing the good work, and well did they perform their respective parts. Napoleon never enjoyed the confidence of his soldiers to any greater extent than does Bro. Charlie Wilson that of the men of our Brotherhood throughout the entire section to which his labors have been devoted, and, I might add incidentally, in every other section of the country as well. His presence with us as usual insured the attendance of every member of the order within a radius of 200 miles or more who wasn't working or who could get excused from duty, and Bro. Wilson on this occasion, inspired, no doubt, by the earnest co-operation of the members themselves, was at his best. His visit materially added vim and vigor to the already great enthusiasm of the movement.

On March 27th we put through 22 candidates, and the Ladies Society served us with one of the finest dinners that a man could wish to sit down to. On the 28th we had another splendid meeting and initiated another large class of candidates, the attendance of visitors from sister lodges being greater on this date than on the day preceding. We talked and smoked and had a fine time all around. The bravery of the boys who rode "Billy" fearlessly through the various obstacles confronting him and them was to all of us a special source of admiration and inspiration. Well, the Sunday class ran our list of new members initiated in the two days up to 54, leaving 7 candidates who have since been "put through." The total number, therefore, already to be credited to this special campaign of organization is 61.

Lest any brother reading this might imagine that we intend to rest on our laurels I want to say that this is but the beginning, for we propose after having made a complete "clean-up" to in the future exercise eternal vigilance (the recognized price of liberty) in seeing to it that the condition of organization within the jurisdiction of our lodge is constantly kept up to the 100 per cent. standard of representation of the men who are eligible to membership in our order.

We feel very grateful to Brother Wilson for the splendid assistance he rendered us on this occasion. We also feel very grateful to Brother Robertson for the able help and encouragement he gave us.

It is usual when an army is engaged in war to give special recognition to soldiers who "distinguish" themselves through acts of bravery or otherwise by "mentioning" them in dispatches. I therefore feel that in this my "dispatch" to headquarters and my "report" of the work of our lodge to the order in general it is only right to "mention" those who have "distinguished" themselves in our recently commenced campaign of organization. This list I will begin with the names of members of the Ladies Society who devoted themselves with special diligence and earnestness to the performance of their part in carrying out the work of our three days' session. Those ladies are Sisters Alma S. Boyse, president L. S. No. 129; P. B. Bouney, F. Smith, Kitty Smith, A. Robinson, E. Cuddebeck (Port Jervis, N. Y.), K. B. Coots, treasurer L. S. No. 129, Tiney Gow and Sister Hissim. The brothers deserving of special mention in this "dispatch" are Bros. Ed Monroe, chairman of the committee of the whole; P. B. Bouney, president of our lodge; D. T. Keefe, recording secretary; Wm. Bope, the hustler, who doesn't back down for any goat, only when odds are too much against him. Also Bro. H. Palmer, the old vet of the Josh Leach class; E. Culver, C. Rickle, H. Snackinburg, F. Saier, and others I can't think of now, and last but not least, Bro. Tim Reagen—the story teller—a dangerous rival of Brother Wilson himself for the humorist and story telling championship.

As many of our brothers who read this may be interested in learning the nature of the circular we sent out amongst the non-Brotherhood men, I give it herewith in full as follows:

To all persons who should by right become members of the Brotherhood of Locomotive Firemen and Enginemen the following information is given:

AIMS AND OBJECTS.

"For the purpose of uniting locomotive firemen and enginemen and elevating their social, moral and intellectual standing and for the protection of their interests and the promotion of their general welfare, the B. of L. F. and E. has been organized. The interest of our members and their employers being mutual, we recognize the necessity of co-operation, and it is the aim of the Brotherhood to cultivate a spirit of harmony between them upon the basis of equity and justice. Realizing the fact that our vocation involves ceaseless peril, and that it is a duty we owe ourselves, our families and those we feel obliged to aid to make suitable provision against those disasters which almost daily overtake us on the rail, the necessity of protecting our interests, of extending to each other the hand of charity and being sober, industrious and honorable men becomes self-evident; and hence the Brotherhood has adopted as its cardinal principles the motto: Protection, Charity, Sobriety and Industry."

TO THE NONBROTHERHOOD FIREMAN.

Dear Sir—Why are you not a brotherhood man? Our Brotherhood is an international organization. We know no political or geographical lines within our jurisdiction. We recognize no political or religious lines. This being the case, we are obliged to comply with rules and regulations emanating from the Grand Lodge. Fraternal organizations, like all others, must be governed by law and order.

We are taught in our lodge rooms to practice benevolence, which is akin to charity; one of the cardinal principles of Christianity. The laws of social benevolence require that every man shall endeavor to assist others by his experiences. This being the case, it would be well for all to remember that the doctrine of the brotherhood of mankind and of universal benevolence is a conspicuous feature of Christianity and fosters a disposition to coestablish the well-being and comfort of others, a desire to alleviate suffering and promote the happiness of and love amongst mankind.

The insurance feature of the Brotherhood is praiseworthy. We pay all just claims in case of accident. We pay the full amount of the insurance policy to a member who suffers the loss of a hand, foot or an eye, or who is disabled from injuries received. If declared incapacitated from the performance of manual labor a beneficiary member receives the full amount of his insurance. Do you realize that the cost of membership also pays for the best and cheapest accident insurance in the world? You can take out a policy ranging from $500 to $3,000 and the cost of the same will be in proportion to the face of policy.

To become a member of Lodge 543 B. of L. F. and E. it would cost you $6.50, which you are privileged to pay in two pay days. For this small amount you can join one of the greatest orders in the world.

From December 1, 1873, to the present time our Brotherhood has paid $12,000,000 (twelve million dollars) to disabled members, and to widows and orphans of deceased brothers. Every dollar of this amount was paid to grateful persons and relieved much anxiety and distress.

Our membership at the present time is over 68,000, distributed among 760 lodges in the United States, Canada and Mexico.

My friend, when you get through reading this circular stop and consider.

You will find as a man and as an honest citizen (and we would not be interested in you if we thought you were otherwise) that it is neither just nor fair to your fellow employes in engine service for you to leave them to bear the burdens of protecting and advancing your interests while you contribute absolutely nothing, either morally or financially, to help them in doing so.

Come out of the bushes and make a square stand for your rights. Shake off that human cowardice and join hands with respectable laborers.

Many of you "nons" are continually admitting that the principles of the Brotherhood are right and just, and that you would strike if we wanted you to do so. You know you state what is not so when you make such a remark. I will say that is not why we want your assistance, but because we believe that organization properly conducted should be treated in a friendly spirit by the employer, and where such is the case the employes will be found to contribute their share of fairness. We also believe that honest recognition by the employer of the just demands of the employe would go far to solve the labor problem and prevent in a measure the experiences of the past where the attitude assumed has been exactly the reverse. These are opinions born of experience and not suggestions born from theory.

You should not lose sight of the fact that organization properly conducted means shorter hours of labor, better wages and the opportunities these give for education, which is a higher degree of civilization in which the employer and employe are benefited. I am at a loss to understand why men make such excuses.

Some will say, "Oh, well, I paid into it for six years." Others will say, "I went to the doctors and never heard anything more about it," and still others will say, "I had to look out for my family first, and in order to pay my grocery bill I was obliged to drop out." This kind of talk would make a true Brotherhood man blush.

Now, Mr. Non-brotherhood man, you are depending upon your labor for subsistence. You admit that shorter hours and better wages would benefit you and yours. You are in many instances today enjoying the benefit of those better conditions brought about by the efforts of organized labor. Then why don't you show some symptoms of sense and gratitude by entering the ranks and helping to build up your class interests instead of becoming a "dead-head" on the ship of honest toil, to be carried through the sea of industrial strife?

Now, Mr. Non-brotherhood man, don't hesitate, but as soon as you read this inquire where the doctor is to be found. We therefore appeal to you in the name of justice, in the name of humanity, in the interest of yourself and family, in the interest of the great class to which you belong, to become a Brotherhood man at once, to join hands with us and to help the Brotherhood both morally and financially in carrying out its noble mission of protection, charity, sobriety and industry.

I take pleasure in presenting this statement of our organization to you, together with my compliments and best wishes.

[Signed] MEMBER 543.
J. COOTS.

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An Appeal on Behalf of the South.

I have been a member of our great Brotherhood for several years and feel ashamed to confess that, realizing all the redeeming features it contains, its admirable officers and their irreproachable services, I have not contributed a line as a token of appreciation of my most fortunate relations with such men and principles. However, being a Kentuckian (by birth) I will take advantage of the old proverb, "Better late than never," and endeavor to express my opinion on what I deem the greatest unsolved problem that rests upon our shoulders.

At our last Convention so many things of importance were transacted that I was bewildered at the report, but I wish at this time to call attention to the Convention's action in creating the office of Organizer for the South, as well as their selection of the officer. Brothers, several years ago Brother Shea addressed Lodge 502, and I remember how emphatic he was when he said that the negro in the South was a fixed proposition to deal with, but I never realized the importance of his convictions until I worked a year in the "Sunny South" myself. When I left a thoroughly organized section in Illinois I came to Mississippi and was dumbfounded at the change. I did not find it disorganized, but instead learned that organization in its actual meaning had never been introduced, and since my location here I am daily reminded of Brother Shea's remarks. Now that the Brotherhood has again exemplified its progressiveness by creating an office for the accomplishment of this purpose, let us put our "shoulders to the wheel" and push it along. The fact that Bro. W. W. Slaby was selected to serve as the "wheel" in this stupendous task should be ample inspiration to insure the cooperation of every individual in the order. This old "war horse" of 502 who has so ably served as master and treasurer for about 15 or 20 years needs no introduction of his personality or ability among his many acquaintances in the South, but to the many thousand members not blessed with his acquaintance I make the appeal that each and every one in every way possible lends a hand to assist Brother Slaby in this great work, for I can assure all our brothers that his integrity and courage are only surpassed by his prudence and diplomacy.

In my opinion, brothers, it will require more work and vigilance to organize one lodge in the South than it would require to organize a trunk line in the East or West. Our Brotherhood's flag with its starry field indicates a little territory not yet admitted to our union, and it behooves us to get together and complete the starry field. Like all other achievements it will require harmony and vigilance to succeed, and the negro in the South is certainly in a position to convince us of this fact. However, in Brother Slaby we have as a leader a genius in diplomacy and a general in execution, and with our harmonious support we will in the near future be able to say that our Order has at last overcome the insurmountable South, defeated the black interloper and placed the four cardinal virtues in each side of the cab. Tactful agitation is the best advertisement for success, and I hope the brothers as well as our worthy Editor and other Grand Officers will work a little overtime on such a worthy movement.

CHAS. GASTON.

Welcome to Brotherhood Members of Knights of Columbus, and Friends.

Admiral Semmes Lodge 689, B. of L. F. and E., Mobile, Ala., desires Brotherhood members of the Knights of Columbus who are planning a visit to Mobile August 4th to 8th for the national convention of that order to know that any assistance desired in securing quarters and in learning how to get the most pleasure out of the trip will be cheerfully rendered by it. Any friends of Brotherhood members who are coming may call on the lodge with the same assurance of cordial assistance.

Address W. J. Everrette, R. S., Admiral Semmes Lodge 689, care of Battle House, Mobile, Ala.

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Automatic Stoker Proving a Success.

The Chicago and Alton Railroad has adopted the Strouse Automatic Stoker, and their locomotives will be equipped with this appliance as soon as the manufacturer can supply the machines. The stoker has proven to be a great success and is unsurpassed in simplicity of construction and operation by any device that has been applied to the locomotive since the invention of the automatic air brake.

At a regular meeting of Blooming Lodge No. 40, on May 12th, the following resolutions were adopted:

WHEREAS, The work of firing the larger class of engines has almost become a physical impossibility, especially during the summer months; and

WHEREAS, The adoption of the Strouse Automatic Stoker by the Chicago and Alton Railroad will greatly reduce the work of firing a locomotive; and

WHEREAS, The stoker is a decided success and it is our desire to help our fellow workmen on other roads by bringing the stoker to their notice and at the same time to help a good thing along; therefore, be it

Resolved, That we, members of Blooming Lodge No. 40, Brotherhood of Locomotive Firemen and Enginemen, endorse the Strouse Automatic Stoker; and be it further

Resolved, That a copy of these resolutions be sent to the Editor and Manager of the Magazine for publication, and a copy be sent to the President of the Strouse Automatic Stoker Company.

Adopted unanimously.

W. P. GRIFFIN,
E. J. SIMMS,
ARCHIE GIBBONS,
Committee on Resolutions.

Approved by
F. L. PIERCE, President,
Blooming Lodge No. 40.

* * *

The Western Federated Board—Its First Meeting.

In response to a call issued from the office of President Carter, the General Chairmen of lines of railroad west, northwest and southwest of Chicago, met at the Lexington Hotel, Chicago, Illinois, Monday, April 5th, and organized the Western Federated Board as provided for in Section 217 of the Constitution and By-Laws of the Brotherhood.

Thirty-two General Chairmen answered the call of the President and a permanent organization was immediately effected, with the following officers elected for a term of two years:

C. K. McKenzie, Atchison, Topeka & Santa Fe, Coast Lines, Chairman.
C. V. McLaughlin, Union Pacific Railway, Vice-Chairman.
Walter D. Moore, Missouri, Kansas & Texas Railway, Secretary-Treasurer.
J. A. Cochran, Great Northern Railway.
J. M. Brickhouse, Missouri Pacific, Iron Mountain System. And
J. I. Parel, Illinois Central Railroad, Board of Trustees.

A constitution and by-laws was adopted for the government of the board, and important action taken regarding several subjects of great concern to the Protective Department of the Brotherhood.

The functions of the Western Federated Board, under the laws of the Brotherhood providing for its existence and maintenance, was considerably discussed with a view to determining the benefits we could reasonably expect from a movement carried out under the laws governing such boards.

The concerted movement of 1907 was frequently referred to, and the increases in wage and the betterment of working conditions secured at that time, seemed to those present, conclusive proof that matters relative to wage and working conditions could be handled more successfully and with better results through concerted movements, embracing the lines of railway in a given territory, than could be expected through the individual action of any one Joint Protective Board. Then, too, the expense incident to a concerted movement, prorated out amongst the roads involved in the movement, is materially less to the individual member than the expense incurred at the sittings of individual joint boards. To those who have paid close attention to the reports of the General Secretary and Treasurer concerning the collections of Joint Board assessments it has long since been realized that the expense attached to the work of the Protective Department of the Brotherhood, when considered as a whole, is enormous; and it is this great expense, together with the attitude of managements of railway systems toward the several committees, that has called the federated boards into existence. It is believed that these federated boards will be the means of making more effective the objects that have always been contemplated by the Protective Department and their service will prove a pleasing feature, looked upon with favor by the rank and file of the organization.

There was much stress laid upon the attitude of railway managements at meetings held with the respective committees representing the men engaged in road service. The idea seems to be everywhere prevalent that the general managers have pledged themselves to support one another in all matters in which the railroad brotherhoods have a direct interest, and in consequence thereof we find in our committee meetings with officials of railroads that we are forced to combat the united forces of all the railway lines in that immediate section which can be considered as competing roads. It seems that the action of one general manager is the concern of all general managers, and that if one transgresses the fixed rules laid down by the General Managers' Association he is immediately taken to task by his associate general managers, with the result that few care to indulge in a second offense; at least we are being constantly informed by our respective managements that they cannot do this or cannot do that, even if they wished, because of the attitude of the general managers in their immediate territory. We infer that the interests which the general managers represent are protected by a well regulated concerted movement and a thorough understanding regarding the position to be assumed on any question involving rates of pay or working conditions. This is the great obstacle that must be encountered by the individual joint board in an undertaking to secure an increase in wage and better working conditions for the men they represent—they must fight single-handed all the railway managements of their territory. The sessions are necessarily long drawn out in arguments regarding the wage and working conditions, not only of their own line, but of neighboring lines as well. The expense attending such meeting is large; the assessments are heavy; and as a result there is considerable dissatisfaction amongst the boys at home, simply because they are not conversant with the trials and tribulations of a joint protective board in these days of diplomatic exchanges of opinion and the high art of fencing employed by the officials when it is their purpose to not give definite replies to questions under consideration. It seems to be the desire of many of the railway managements to continue the committees in session until the patience of the men at home is exhausted; the company makes capital out of dissatisfied members of the Brotherhoods, and sometimes, where this condition prevails, they take pride in telling you that the men are not with you on some demand that may have been made regarding working conditions, or that the men are not in sympathy with increases in pay requested by the committee. It does not take long for railroad companies to find out the temper of the men, and unless there is that singleness of purpose in evidence that should be found in any body of true, loyal, zealous Brotherhood men, the committee that is endeavoring to legislate for them will have a rough road to travel before the negotiations are concluded.

We believe that the federated boards will do away with these dissatisfied murmurings; that the expense account will not necessitate heavy assessments; that the returns for the money invested in concerted movements will be such that even the most pessimistic will see the wisdom of handling general propositions in this manner. In fact we believe that the Protective Department is entering upon a new era which will be the means of producing greater results at a much less expense per member than ever before in the history of the Brotherhood.

There was also much attention given to the industrial conditions of the western country, and we learned that nearly all of the railway systems are again entering upon a period of retrenchment in all of their several departments; business is very slack generally; regular runs are being pulled off; the regular lists are being reduced; extra lists are being cut, and as a result on many of the roads passenger firing runs are held by men who have had years of service as engineers; men who were not forced back on the firemen's lists even in the panicky times of two years ago, and the worst feature is that there seems to be no immediate relief. We are in hopes that the settlement of the tariff question now before Congress will do much toward reviving business to its normal standard. With these conditions facing the General Chairmen at this meeting of the Western Federated Board, it could not be expected that any definite action would be taken regarding a movement in the near future relative to a betterment of wage and working conditions; but the Federated Board can be used, however, in protecting our schedule regulations if the retrenchment policy of the railroads go so far as to contemplate a wage reduction. We do not believe that the railway companies will go so far as that, but it is well to know just what can be done if we are called upon to face an issue of that character.

There were many subjects discussed at this first meeting of the Western Federated Board which cannot be given space in the columns of the Magazine. Each lodge and each local chairman will receive a copy of the minutes of this meeting, and it is to be hoped that these minutes will receive the careful consideration of all lodges and of all members of the Brotherhood. It is the duty of all members of the Brotherhood employed in engine service in the territory under the jurisdiction of these federated boards to acquaint themselves with the nature of the business transacted at their meetings, so that they will be in a position to judge intelligently as to the work done or the work contemplated for the benefit of the men in their respective districts.

WALTER D. MOORE.

Correspondence

LODGE 538—(*H. C. Wickliffe, Chicago, Ill.*) Realizing that the laws of our organization covering the publication of communications in the Magazine permit the mention in its columns of the death of a general chairman, I find it my sad duty to record the demise of a brother filling that position whose passing away will prove a serious loss to the Brotherhood in general, and more particularly to all with whom he was identified in the performance of his every-day duties as a member of our order and as an employe of our company. Bro. F. M. Walsh, at the time of his death, in addition to being general chairman of the Joint Protective Board of the Chicago, Lake Shore and Eastern R. R., was also president of Gladstone Lodge No. 538.

Brother Walsh was unanimously chosen president of our lodge when elected to that office and performed his every duty as such with good judgment, care and fidelity. It was through his excellent business management that 538 found itself able to weather the storm and overcome the effects of the severe financial strain to which it was subjected, as explained in a letter from Gladstone Lodge appearing in the Magazine a few months ago. In the accomplishment of these results Brother Walsh was ably assisted by our worthy brothers, Chas. Dunn and William A. Pitzle, financial and recording secretaries, respectively.

Brother Walsh's death came about in the following manner: About three weeks prior thereto his finger was scratched by the shaker bar slipping off while he was shaking the grates on his engine. He bound the wound with electric tape and it apparently healed up perfectly. As he had soon completely recovered from the effects of the accident he returned to work in a few days thereafter. On the evening of April 13 he went to bed apparently in perfect health, but could not be awakened the following morning. Some of the best physicians and medical professors in Chicago were called in, but could do nothing for him, and he died on April 15 without regaining consciousness, the decision of the doctors being that Brother Walsh, while asleep, was attacked with lock-jaw, resulting from blood poisoning which was occasioned by the wound on his finger.

Our lodge was given full charge of the funeral by Brother Walsh's family, and the brothers left nothing undone in showing every respect and fraternal regard to the remains of our departed president. The local Ladies Society of the B. of L. F. and E marched to the church with us. During the services, which were held in St. Bride's Roman Catholic Church, of which Brother Walsh was a member, the Rev. Father O'Sullivan said in his sermon that often the good qualities of the departed were exaggerated in their funeral sermons, but that it would be difficult to exaggerate the extent to which the very highest qualities of head and heart were combined in Brother Walsh's character.

The floral offerings overtaxed the capacity of one carriage. The funeral as it left the church consisted of the hearse and thirty carriages. During the interment our chaplain, Bro. Wm. Ryan, and worthy vice-president, Bro. S. E. Snyder, performed their respective parts in the funeral services with much credit to themselves. J. Kirk, superintendent; Chas. Doorley, assistant superintendent; M. S. Monroe, master mechanic; Chas. E. Topp, traveling engineer, and H. H. Moses and Wm. Stoddard, foremen of engines, all officials of the C., L. S. & E. R. R., rendered us every assistance in their power, for which we are indeed deeply grateful. They went so far as to pull engines off and assign laborers to firing switch engines, so as to permit of our members attending Brother Walsh's funeral, our master mechanic, Mr. M. S. Monroe; our traveling engineer, Mr. C. E. Topp, and foreman of engines, Mr. H. H. Moses, themselves attending in person. General yardmaster, Mr. H. Molyneaux, and roundhouse foremen, A. Guise and A. Youwer, also rendered us much kind assistance.

Besides those occupying the carriages in the funeral procession, a very large number of people took the cars to the cemetery.

Brother Walsh will ever be remembered by the members of Gladstone Lodge, and in fact by all who knew him, with sentiments of love and respect.

LODGE 296—(*Member, Superior, Wis.*) As it is a long time since I saw anything in the Magazine from Iron Range Lodge, I thought I would let the boys know that we are still alive and getting a few new members all the time, and when business picks up we hope to increase our membership by at least 25. On April 22d we held a joint meeting and invited the brothers of the O. R. C., B. of R. T. and the B. of L. E. to join with us in our meeting and talk over federation, but the members of the other orders did not turn out very strong. They don't know what they missed, as Brother Richardson of the O. R. C., and Brother Cochran, our salaried chairman, each gave us a good talk on the needs of federation, and told some good stories, as did some of the other brothers who were present, and the time passed away very pleasantly for a couple of hours. I think it will not be long until Iron Range Lodge will give another such meeting, as the boys all enjoyed themselves and seemed to derive much benefit therefrom. I am glad to state that the boys are attending lodge meetings better since we hold them every week, and I hope they will continue to do so, as there is nothing so encouraging to us as to have a good big turnout on meeting nights, and it is better to tell your troubles in the lodge room than in the roundhouse or on the street corner.

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LODGE 724—(*W. L. Smoke, Columbus, Ga.*) The time of meeting of Pelham Lodge 724 has been changed to the first and third Sundays in each month. Bro. W. W. Slaby was with us a short time ago, and although we did not have a meeting, he gave the boys (those he could see) a good talk, and I think did a lot of good. He is a plain-spoken man and puts every word in the right place, and that is just what we want. I am sorry to say that some of the boys do not take as much interest as they should, apparently thinking that all they have to do is to pay their dues and one or two can do the rest. There are three or four of us willing to do the "rest" if they will come up promptly with their dues. They all seem to be doing better since Brother Slaby's visit. I would have liked very much to have him with us at a meeting, but as we had changed the date of our meetings he came at the wrong time. I neglected stating that we would meet in Odd Fellows' Hall.

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LODGE 321—(*Member, Chapleau, Ont.*) I know there is not a member of our lodge away from home that does not enjoy an occasional letter from us, although in writing at this time it will be difficult to say that the past few months have been as we would wish them to be, while we have been prosperous in a financial way. I regret to state that Bro. J. T. Smith has lost his wife. We certainly extend him our heartfelt sympathy. Business is a trifle dull here this month, but as a number of the regular men are laying off we are keeping most of our younger men on the list, so we are doing good business considering the hard times. We have a large number of engineers in our lodge and have hopes of having more new firemen in the near future. We have an excellent set of officers, of which we are proud. Bro. H. A. Pepper, our president, cannot be excelled, and Bro. H. L. Best, our local chairman, is certainly "onto his job" when it comes to taking up grievances for the boys.

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Official

Addresses Wanted.

Persons requiring the address of or any information concerning another will please communicate with the secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the secretary of such lodge, requesting that a notice be published in the Magazine inquiring for such address or other information, same will be complied with. However, the Magazine cannot undertake the office of a collecting agency, and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the person specified in the notice:

Martin Skillingstad.—Was at one time a member of Lodge 697. Came to North Battleford, Sask., from St. James, Minn., and was last heard of at Calgary, Alta., working as a coal passer on some of the large engines on the C. P. R. Since then we have been unable to locate him. It was reported that he had committed suicide while at Calgary, but this report was not confirmed. He is of medium height, is stout, has dark hair and fine looking complexion (clear and rosy). His wife and family would like to learn of his whereabouts and whether he is dead or alive. Any information will be gladly received by his wife, Mrs. Martin Skillingstad, St. James, Minn., or R. A. Trann, recording secretary, Lodge 697, B. of L. F. and E., Box 9, North Battleford, Sask., Canada.

Ed C. Armstrong.—When last heard of he was working on the Mexican Central Railroad, at Cardenas, Mexico. Anyone knowing his whereabouts will please correspond with W. W. Holt, 122 Leroy street, Los Angeles, Cal. Mr. Holt has something of interest to impart to Mr. Armstrong.

Frank Gregory.—Formerly lived in Kingston, N. Y. When last heard of was in the employ of the Lehigh Valley Railroad, with headquarters at Jersey City, N. J. His people living in Kingston, N. Y., would like very much to locate him. Any one in possession of any information will please address J. D. Hubbard, Lodge 468, B. of L. F. and E., 28 Staples street, Kingston, N. Y.

R. R. Grooms.—He left Pittsburg in April, 1908, for some place in Maryland. At that time was a member of Lodge 633, B. of L. F. and E. When last heard from he was employed on the Annapolis Short Line at Shipley Station, A. A. Co., Md., about August, 1908. Has light hair, blue eyes, is 23 years of age, about five feet six inches tall and weighs about 150 pounds. Information as to his whereabouts will be gladly received by Mrs. R. R. Grooms, 25 Ethel street, Pittsburg, Pa., or W. F. Wessell, Recording Secretary Lodge 633, B. of L. F. and E., 373 Kearcher street, Pittsburg, Pa.

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Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Traveling card and receipts good until May 31, 1909, belonging to John Kowadeck, member of Lodge 322, B. of L. F. and E., were recently lost. If found please return to John Kowadeck, care Great Western Hotel, Dubuque, Iowa.

Pocketbook containing receipts from March 30, 1908, to March 30, 1909; also traveling card belonging to Edw. A. Taddicken, member of Lodge 43, B. of L. F. and E., was recently lost or stolen. If found please return to Wm. H. Klecan, Recording and Financial Secretary of Lodge 43, B. of L. F. and E., 615 S. Sixteenth street, St. Joseph, Mo.

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Acknowledgments.

Mrs. Ella Hourigan and Annie Hourigan, of Albia, Iowa, wish to thank the Grand Lodge of the B. of L. F. and E. for the prompt payment of the claim of Bro. Thomas M. Hourigan. They also wish to thank the members of his lodge, No. 41, and the wives of the brothers for their great kindness to them during his sickness and death.

Bro. James J. Flynn, of Lodge 1, Hawley, Pa., desires to thank the officers and members of his lodge, as well as the B. of L. F. and E. in general, for their kindness to him during his sickness and for the prompt payment of his disability claim. It is his wish that the officers and members of the old "Tried and True" will continue to prosper.

Bro. Adolph Hanson, of Red River Lodge No. 8, desires to thank the Board of Directors of the B. of L. F. and E. for allowing him $500.00 on his policy at their January meeting. He also wishes to thank the members of Red River Lodge No. 8 and Bro. Joseph Myers, of Austin, Texas, for assisting him to secure the same.

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The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of April, 1909:

L. S. to B. of L. F. and E. Lodges 3, $5; 8, $3; 33, $5; 54, $5; 56, $5; 64, $5; 74, $5; 76, $2; 81, $2; 102, $5; 103, $5; 118, $5; 121, $5; 163, $2; 195, $5; 201, $5; 215, $2.75	$71 75
O. R. C. Divisions	182 50
B. of R. T. Lodges	276 77
B. of L. E. Divisions	210 00
L. A. C. Divisions	38 00
G. I. A. Divisions	$190 50
L. A. T. Lodges	88 75
James Costello, Division 270, O. R. C	1 00
Alfred Lunt, Lodge 456, B. of R. T.	1 00
F. S. Barnes, Lodge 28, B. of R. T.	1 00
J. McQuaid, Lodge 39, B. of L. F. and E.	1 00
Ray N. Watterson, Danville, Ill.	1 00
Augusta Statzer, Danville, Ill.	1 00
Members of Division 24, O. R. C	11 75
Members of Division 434, O. R. C	5 00
Larned Carter & Co	50 00
C. and N. W. Conductors' Room, Station 23	3 00
John Lynch, Division 111, B. of L. E	50
T. E. Cavanaugh, Lodge 115, B. of R. T.	75
From B. of L. F. and E., by A. H. Hawley	750 89
Total	$1,886 16

Miscellaneous.—Sheets, pillow cases, handkerchiefs, hosiery and towels from eight sisters of Division 317, G. I. A., and box of cigars from Bro. D. Vaughen, Division 240, O. R. C.

Respectfully submitted,
JOHN O'KEEFE,
Sec. and Treas., R. R. M. H.

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Beneficiary Statement

OFFICE OF GENERAL SECRETARY AND TREASURER.
PEORIA, ILL., May 1, 1909.

TO SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of April, 1909:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	696 30	74	243 10	147	332 20	220	784 30	293	205 70	366	121 00	439	127 60	512	215 60	585	140 80
2	55 00	75	....	148	413 65	221	199 10	294	....	367	....	440	257 40	513	137 50	586	....
3	1078 00	76	....	149	621 50	222	143 00	295	398 20	368	146 30	441	239 80	514	....	587	176 25
4	363 00	77	581 90	150	452 10	223	291 50	296	535 70	369	238 70	442	....	515	275 00	588	....
5	....	78	....	151	....	224	123 20	297	393 80	370	93 50	443	257 40	516	193 60	589	102 30
6	475 60	79	101 20	152	....	225	....	298	269 50	371	236 50	444	594 00	517	....	590	355 05
7	336 65	80	....	153	193 60	226	400 40	299	192 50	372	....	445	309 90	518	....	591	320 10
8	667 70	81	166 10	154	....	227	....	300	326 70	373	....	446	....	519	380 60	592	191 40
9	502 70	82	257 15	155	119 90	228	645 70	301	201 30	374	....	447	232 10	520	57 20	593	112 20
10	1105 50	83	529 10	156	348 70	229	330 00	302	....	375	133 10	448	889 90	521	240 90	594	220 00
11	383 90	84	190 30	157	113 30	230	665 50	303	140 80	376	61 60	449	446 60	522	364 10	595	....
12	323 40	85	429 00	158	143 00	231	800 80	304	247 50	377	267 30	450	408 10	523	113 30	596	188 10
13	369 60	86	....	159	308 75	232	275 00	305	....	378	786 50	451	220 00	524	63 80	597	242 00
14	587 40	87	277 40	160	278 30	233	326 70	306	363 00	379	524 70	452	147 40	525	212 30	598	122 10
15	213 40	88	220 00	161	107 80	234	261 80	307	283 00	380	152 90	453	79 20	526	....	599	....
16	712 80	89	73 70	162	627 00	235	322 30	308	82 50	381	465 30	454	....	527	189 20	600	299 20
17	277 20	90	137 50	163	259 60	236	543 40	309	455 50	382	....	455	150 70	528	334 40	601	354 20
18	253 00	91	555 50	164	121 00	237	570 90	310	379 50	383	317 90	456	229 90	529	....	602	290 40
19	402 60	92	256 30	165	100 10	238	305 80	311	129 40	384	317 50	457	213 40	530	....	603	182 60
20	69 30	93	167 50	166	355 30	239	112 20	312	257 40	385	105 60	458	....	531	135 30	604	....
21	585 20	94	....	167	236 50	240	603 90	313	207 90	386	81 40	459	110 00	532	158 40	605	201 30
22	132 00	95	92 40	168	251 90	241	....	314	....	387	187 00	460	123 20	533	119 90	606	37 40
23	206 80	96	236 50	169	517 00	242	435 60	315	....	388	273 90	461	204 60	534	398 20	607	49 50
24	507 10	97	611 20	170	....	243	169 40	316	315 70	389	140 80	462	....	535	217 80	608	3 00
25	432 30	98	....	171	....	244	226 60	317	90 20	390	225 50	463	283 80	536	182 60	609	80 30
26	336 60	99	785 40	172	144 10	245	159 50	318	....	391	223 60	464	275 00	537	157 30	610	70 40
27	355 10	100	346 50	173	378 40	246	326 80	319	225 50	392	204 60	465	308 00	538	....	611	125 40
28	263 70	101	415 80	174	889 90	247	....	320	55 00	393	235 40	466	229 90	539	393 80	612	139 70
29	205 70	102	214 50	175	467 50	248	386 10	321	196 90	394	37 40	467	217 80	540	421 30	613	35 20
30	233 20	103	....	176	225 50	249	368 25	322	130 90	395	114 40	468	47 30	541	213 40	614	383 90
31	238 70	104	167 20	177	237 60	250	320 10	323	92 40	396	....	469	187 00	542	....	615	....
32	225 50	105	....	178	288 20	251	476 30	324	....	397	....	470	331 10	543	449 90	616	108 90
33	239 80	106	132 00	179	191 40	252	448 80	325	....	398	191 40	471	....	544	140 25	617	198 00
34	311 30	107	401 60	180	118 80	253	425 70	326	280 50	399	145 20	472	435 60	545	....	618	202 75
35	168 30	108	264 75	181	92 40	254	158 40	327	375 10	400	206 80	473	47 30	546	....	619	....
36	....	109	278 30	182	465 30	255	119 90	328	....	401	398 20	474	200 20	547	177 10	620	190 30
37	260 70	110	249 70	183	353 10	256	....	329	97 90	402	143 00	475	....	548	119 90	621	....
38	139 70	111	....	184	112 20	257	....	330	376 20	403	78 10	476	121 00	549	190 30	622	305 80
39	196 90	112	77 00	185	125 40	258	66 00	331	212 30	404	201 30	477	427 90	550	118 80	623	156 20
40	543 05	113	233 20	186	47 30	259	....	332	....	405	333 30	478	....	551	....	624	103 40
41	....	114	82 50	187	140 80	260	449 90	333	371 80	406	117 70	479	149 60	552	342 10	625	129 80
42	85 80	115	169 40	188	556 60	261	113 30	334	369 60	407	392 70	480	63 80	553	....	626	....
43	261 80	116	122 75	189	359 70	262	462 00	335	....	408	275 00	481	191 40	554	152 90	627	116 60
44	391 60	117	151 80	190	104 50	263	277 20	336	145 25	409	....	482	....	555	151 80	628	172 70
45	672 10	118	68 20	191	586 30	264	155 10	337	446 60	410	234 30	483	....	556	72 60	629	31 90
46	46 20	119	193 60	192	473 00	265	495 00	338	207 90	411	255 20	484	232 10	557	360 80	630	161 70
47	....	120	267 30	193	173 80	266	306 90	339	....	412	....	485	1296 90	558	266 20	631	171 60
48	481 80	121	411 40	194	....	267	4 50	340	207 90	413	57 20	486	101 20	559	....	632	95 70
49	180 40	122	42 25	195	156 20	268	74 80	341	303 60	414	....	487	39 60	560	93 50	633	178 20
50	111 10	123	343 20	196	157 30	269	125 40	342	337 70	415	166 10	488	99 00	561	301 40	634	....
51	279 40	124	237 60	197	144 10	270	466 40	343	105 60	416	258 50	489	....	562	485 10	635	160 75
52	474 10	125	....	198	485 10	271	200 20	344	....	417	137 50	490	375 10	563	357 50	636	92 40
53	212 30	126	212 40	199	250 80	272	82 50	345	341 00	418	....	491	97 90	564	301 40	637	104 50
54	557 70	127	339 30	200	92 40	273	310 20	346	37 40	419	172 70	492	....	565	82 50	638	248 60
55	73 70	128	....	201	213 40	274	178 20	347	127 60	420	....	493	93 50	566	....	639	92 80
56	314 60	129	12 00	202	283 80	275	429 00	348	295 90	421	117 70	494	147 40	567	215 60	640	77 00
57	759 00	130	496 15	203	383 90	276	412 50	349	....	422	123 20	495	....	568	222 20	641	139 70
58	265 10	131	67 10	204	361 90	277	192 50	350	....	423	63 80	496	....	569	295 90	642	150 70
59	677 60	132	166 10	205	158 40	278	36 30	351	56 10	424	232 15	497	167 20	570	140 80	643	77 00
60	504 90	133	....	206	114 40	279	113 30	352	133 10	425	....	498	178 20	571	315 70	644	155 10
61	187 00	134	96 80	207	388 30	280	201 30	353	....	426	400 40	499	60 50	572	218 85	645	93 50
62	145 20	135	265 10	208	....	281	311 30	354	....	427	....	500	191 40	573	....	646	398 20
63	....	136	....	209	181 50	282	51 70	355	332 05	428	125 40	501	302 50	574	182 60	647	118 80
64	267 30	137	133 10	210	118 80	283	147 40	356	268 40	429	178 20	502	331 10	575	124 30	648	73 70
65	291 50	138	389 40	211	365 20	284	933 90	357	106 70	430	107 80	503	....	576	113 30	649	64 90
66	218 20	139	518 10	212	259 60	285	....	358	250 80	431	102 30	504	110 00	577	84 70	650	80 30
67	166 10	140	448 80	213	222 20	286	338 80	359	243 50	432	....	505	101 60	578	357 50	651	201 30
68	....	141	988 90	214	760 10	287	1562 00	360	165 00	433	....	506	171 60	579	89 10	652	333 45
69	132 00	142	255 20	215	....	288	....	361	170 50	434	232 10	507	246 40	580	....	653	123 20
70	271 75	143	657 80	216	196 90	289	188 10	362	119 90	435	160 75	508	487 30	581	92 40	654	....
71	479 60	144	85 80	217	277 20	290	284 90	363	8 25	436	347 60	509	113 30	582	117 70	655	66 00
72	496 10	145	287 10	218	361 90	291	91 30	364	178 20	437	51 70	510	....	583	151 80	656	138 60
73	....	146	383 90	219	348 70	292	49 50	365	59 40	438	196 90	511	298 10	584	....	657	....

Beneficiary Statement—*Continued.*

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
658	....	671	150 70	684	....	697	....	710	145 20	723	52 80	735	143 00	747	95 70	759	....
659	245 30	672	132 00	685	....	698	234 30	711	119 90	724	....	736	58 30	748	91 30	760	194 70
660	117 70	673	950 40	686	....	699	124 30	712	38 50	725	81 40	737	28 60	749	150 70	761	....
661	128 70	674	58 30	687	80 30	700	....	713	125 40	726	66 00	738	31 90	750	61 60	762	63 80
662	71 50	675	....	688	144 10	701	277 20	714	....	727	69 30	739	161 70	751	68 20	763	....
663	189 25	676	83 60	689	128 70	702	....	715	61 60	728	....	740	114 40	752	....	764	....
664	....	677	189 20	690	....	703	....	716	108 90	729	62 70	741	72 60	753	66 00	765	....
665	107 80	678	....	691	61 60	704	257 20	717	35 20	730	113 30	742	....	754	81 40	766	36 30
666	347 60	679	156 20	692	....	705	....	718	60 50	731	....	743	....	755	....	767	84 70
667	141 90	680	121 00	693	35 20	706	46 20	719	235 40	732	68 20	744	23 10	756	....	768	....
668	160 60	681	203 50	694	147 40	707	97 90	720	....	733	84 70	745	51 05	757	....	769	....
669	90 20	682	125 40	695	91 75	708	141 00	721	55 00	734	132 00	746	....	758	53 90	770	....
670	435 60	683	234 30	696	72 60	709	119 90	722	....								

Received during month of April **$150,329.85**

Respectfully submitted, A. H. HAWLEY, G. S. and T.

Statement of Benevolent Claims.

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM MARCH 31st, 1909, TO APRIL 30th, 1909.

Claim No.	NAMES.	Lodge No.	Amount Carried.	Amount Paid.
868	J. B. Fitzpatrick	242	$1,500	$ 500
1048	Edward C. Powers	63	1,500	500
1155	Jacob A. Barrigar	259	1,500	1,000
1295	John P. Murray	256	1,500	1,000
1166	George H. Pratt	485	1,000	500
1176	Joseph E. Herbert	56	1,500	500
1505	Chas. P. Minors	231	1,500	500

7 benevolent claims paid in April aggregating $1,500.00.

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Statement of Death and Disability Claims

PAID BY THE GENERAL SECRETARY AND TREASURER, FROM MARCH 31, 1909, TO APRIL 30, 1909.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't of Ins.	Cause.
82	V. Van Vickle........	400	Disability	Feb. 9, 1909	$1,500	Locomotor ataxia.
71	Geo. K. Hart..........	59	"	Mar. 29, "	1,500	Paralysis and locomotor ataxia.
74	Clyde Guyer...........	573	Death.....	Jan. 28, "	1,000	Appendicitis.
1490	S. Merville Miller....	326	"	Nov. 5, 1908	1,500	Derailing of train.
42	Henry J. Carter.......	314	"	Jan. 5, 1909	1,500	Pneumonia.
59	Geo. O. Wilson...	133	"	" 15, "	1,500	Appendicitis.
114	Charles K. James	75	Disability	Feb. 26, "	1,000	Paralysis of left side.
115	Clarence O. Fry	17	"	Dec. 31, 1908	1,500	Amputation of foot.
117	John G. Burchell.....	341	Death.....	Feb. 12, 1909	1,500	Collision.
118	James J. Flynn.......	1	Disability	Mar. 23, "	1,500	Locomotor ataxia.
123	Isaac Dunn............	224	Death.....	Feb. 15, "	1,500	Typhoid fever.
132	Clifford A. Espy......	375	Disability	Apr. 2, "	1,500	Consumption of lungs.
133	Herchall L.McLendon	247	Death	Feb. 5, "	1,500	Falling from engine.
134	John E. Beasley......	433	"	" 11, "	1,000	Derailing of engine.
135	Jeremiah J. Sullivan.	47	"	" 4, "	1,500	Collision.
136	George C. Davis......	231	"	" 22, "	1,500	Collision.
137	Carl O. Bloom	407	"	" 10, "	1,500	Boiler explosion.
139	David E. Earnest.....	446	Disability	" 14, "	1,500	Amputation of foot.
140	John F. Schimmin...	203	Death....	" 26, "	1,500	Boiler explosion.
141	Raymond Walsh.....	143	Disability	" 12, "	1,500	Amputation of foot.
143	John L. Swett	460	Death	" 13, "	1,000	Malarial fever.
145	John F. Schappell....	271	"	" 15, "	1,500	Acute pancreatitis.
146	William F. Williams.	244	"	" 19, "	2,000	Pneumonia.
149	James Grace	472	"	" 21, "	1,500	Spinal meningitis.
150	Joseph H. Brown.....	215	"	Mar. 1, "	1,500	Pneumonia.
152	Herxes A. Eckroth...	562	"	Feb. 28, "	1,500	Pneumonia.
153	Grant Emery..........	93	Disability	" 24, "	1,500	Amputation of hand.
155	Chas. F. Gibson......	163	"	" 24, "	1,500	Amputation of hand.
162	Ernest L. Pyetzki	573	"	Mar. 23, "	500	Paralysis.
165	Chas. Harrison......	439	Death	" 8, "	1,500	Pneumonia.
167	Wm. W. Patrick......	156	"	Feb. 13, "	1,500	Pneumonia.
168	Frank A. Hegarty	44	"	Mar. 3, "	1,500	Kidney trouble.
172	Levi Watkins	199	"	Feb. 27, "	1,500	Pneumonia.
173	Thomas M. Hourigan	41	"	Mar. 4, "	1,500	Acute Erysipelas.
175	James C. Ryan........	47	"	Dec. 21. 1908	1,500	Nephritis.
176	Thomas J. Nolan.....	149	Disability	Nov. 25, "	1,500	Amputation of foot.
94	Ernest H. Vaden	147	"	Mar. 30, 1909	1,500	Blind in one eye.
160	Harry A. Place........	431	Death.....	Feb. 25, "	1,500	Consumption.
170	Edward J. Cashman..	243	Disability	Mar. 31, "	1,500	Blind in one eye.
171	J. E. Harwell	45	"	Apr. 1, "	1,500	Bright's disease.
188	Howard W. Kidd	182	Death	Feb. 21, "	1,500	Pneumonia.
47	Ernest A. Hawkins...	341	"	Jan. 14, "	1,500	Derailing of engine.
151	Joseph E. Lane.......	140	"	Feb. 10, "	1,500	Derailing of engine.

Death Claims Paid.

24—A	**$36,000.00**
3—B	**3 000.00**
C	
1—D	**2,000.00**
E	
28	**$41,000.00**

Disability Claims Paid.

13—A	**$19,500**
1—B	**1,000**
1—C	**500**
15	**$21,000**

43 death and disability claims paid, aggregating $62,000.00

Pending Claims April 30, 1909.

64 death claims aggregating	**$83,500**
36 disability claims aggregating	**54,500**
Total of 100 claims aggregating	**$138,000**

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Statement of Death and Disability Claims

FILED WITH THE GENERAL SECRETARY AND TREASURER DURING THE MONTH ENDING MAY 15, 1909.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
234	Joseph Dalles	86	Apr. 16, 1909	Death	Heart disease	$1,000
235	Francis M. Walsh	538	" 17, "	"	Blood poison	1,000
236	Andrew J. Gressman	478	" 17, "	"	Typhoid fever	1,500
237	George R. McLain	175	" 17, "	"	Derailing of engine	1,000
238						
239	Relland G. Winand	673	" 19, "	"	Derailing of engine	1,500
240	James E. Johnston	646	" 19, "	Disability	Amputation of hand	1,500
241	Wm. S. McCammon	467	" 19, "	"	Amputation of hand	1,500
242	Abraham V. Groat	230	" 20, "	Death	Typhoid fever	1,500
243	Oscar E. Jones	147	" 20, "	"	Gunshot wound	3,000
244	Thos. E. Duncan	223	" 20, "	"	Nephritis	1,000
245	Stephen A. Callahan	306	" 20, "	"	Pneumonia	1,500
246	Newton T. King	289	" 20, "	Disability	Consumption of lungs	1,500
247	Wm. Farley	618	" 20, "	"	Blind in one eye	1,500
248	Martin McManus	64	" 22, "	"	Locomotor ataxia	1,500
249	Frank G. Pohley	388	" 22, "	"	Bright's disease	1,500
250	Bronte Burgster	35	" 23, "	Death	Appendicitis	1,000
251	E. L. Welton	37	" 23, "	Disability	Blind in one eye	1,500
252	Peter Serens	99	" 23, "	Death	Consumption of lungs.	1,500
253	John H. Hawkshaw	172	" 24, "	"	Struck by obstruction near track.	500
254	Jas. A. McLeod	504	" 24, "	"	Meningitis	1,500
255	Melville Dodge	57	" 26, "	"	Bright's disease	1,500
256	Wm. T. Nelson	636	" 26, "	"	Pleurisy	1,000
257	Geo. H. Spinning	354	" 26, "	"	Degeneration of heart	1,500
258	Hugh Gallagher	250	" 26, "	Disability	Paralysis	1,500
259	Samuel S. Hickman	248	" 26, "	"	Consumption of lungs	1,500
260	Philip J. LeSueur	267	" 26, "	"	Impaired vision and rheumatism	1,500
261	I. M. Whiteman	203	" 29, "	"	Neurasthenia	1,500
262	John Johnson	192	" 29, "	Death	Derailing of engine	1,500
263	Newton T. King	289	" 29, "	"	Consumption of lungs	1,500
264	Wm O. Nolan	411	" 29, "	"	Heart disease	1,500
265	Fred B. Robertson	232	" 29, "	Disability	Partial blindness	1,500
266	Wm. R. Bensinger	431	" 30, "	"	Epilepsy	1,000
267	Pearlman F. Zimmerman	327	" 30, "	"	Sundry injuries	1,500
268	Harley Pangborn	207	" 30, "	Death	Consumption of lungs	1,500
269	Jas. J. Turner	407	" 30, "	Disability	Amputation both hands	1,500
270	Frank R. McKellip	287	May 1, "	Death	Pneumonia	1,500
271	Michael R. Jones	245	" 1, "	Disability	Amputation of foot	1,500
272	John W. Lauterbach	432	" 4, "	Death	Paralysis	1,000
273	Chas. F. Talbert	480	" 4, "	"	Derailing of engine	1,500
274	Jos. C. Columbus	243	" 4, "	Disability	Consumption of lungs	1,500
275	Hugh J. Reilly	211	" 6, "	"	Bright's disease	1,500
276	Frank Nugent	608	" 6, "	Death	Struck by engine	500
277	Homer L. McCoy	347	" 6, "	Disability	Amputation of hand	1,500
278	John R. Cobleigh	73	" 6, "	Death	Heart disease	1,500
279	Winfred Wheeler	236	" 6, "	"	Collision	1,500
280	Geo. W. Higgins	3	" 6, "	"	Consumption of lungs	1,500
281	Thos. H. Haines	364	" 7, "	Disability	Heart disease	1,500
282	M. C. Gardner	466	" 7, "	"	Partial amputation of foot	1,500
283	Amos Barker	663	" 7, "	Death		1,500
284	Wm. H. Stitt	192	" 10, "	"	Striking wire cable	1,500
285	Louis L. Dickinson	564	" 11, "	"	Organic heart disease	1,500
286	Harry T. Smith	174	" 12, "	Disability	Blind in one eye	1,500
287	Samuel T. Scruggs	497	" 12, "	Death	Struck by passing train	1,000
288	S. Edward Powers	47	" 13, "	"	Crushed by stone wall	500
289	John M. Crane	331	" 13, "	Disability	Amputation of foot	1,500
290	Jacob Wolf	99	" 15, "	Death	Heart disease	1,500
291	Lew J. Fausnacht	620	" 15, "	Disability	Blind in one eye	1,500

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Beneficiary Assessment No. 5.

General Fund Assessment No. 7.

(SERIES I.)

OFFICE OF THE GRAND LODGE OF THE B. OF L. F. AND E.
PEORIA, ILL., June 1, 1909.

To all Members of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that Beneficiary Assessment No. 5 for the payment of death and disability claims, General Fund Assessment No. 7 and Local Assessments are now payable and must be paid to the Financial Secretary of your Lodge on or before July 1, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$3 30	$0 25	......
Class D Members	2 20	25	......
Class A Members	1 65	25	......
Class B Members	1 10	25	......
Class C Members	55	25	......

Local Lodge Assessment in such an amount as may be determined by your lodge, but in no case to be less than 25 cents.

Any member failing or declining to make payment, as above provided, will be subject to expulsion from the order, as per Section 170 of the Constitution, said expulsion taking effect July 2, 1909.

Yours fraternally,

W. S. CARTER,
President.

A. H. HAWLEY,
General Secretary and Treasurer.

Notice to Financial Secretaries.

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., June 1, 1909.

To Financial Secretaries of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified to collect Beneficiary Assessment No. 5, and General Fund Assessment No. 7 (now due and payable on or before July 1, 1909), from all beneficiary members on the rolls of your lodge June 30, 1909, in the following amounts, viz.:

	Beneficiary Assessment.	*General Fund Assessment.*	*Local Assessment.*
Class E Members	$3 30	$0 25	......
Class D Members	2 20	25	......
Class A Members	1 65	25	......
Class B Members	1 10	25	......
Class C Members	55	25	......

You will also collect from all honorary and non-beneficiary members General Fund Assessment No. 7, and from all members Local Lodge Assessment in such an amount as may be determined by your lodge (in no case to be less than 25 cents), and pay same to the Treasurer of your lodge on or before the fifth (5th) day of July, and forward a report to the General Secretary and Treasurer of all expulsions on account of non-payment of assessments, as per Section 170 of the Constitution. Every member admitted to the Beneficiary Department during the month of June will be liable for double the above amount for beneficiary assessment for the month of July, according to class of certificate.

Yours fraternally,

W. S. CARTER.
President,

A. H. HAWLEY,
General Secretary and Treasurer.

THE WHITE LIFE

BY ADELBERT CLARK.

Don't talk behind a fellow's back!
Just be an honest friend
And face him in the wars of life
To fight him or defend.
Let Friendship's rainbow brightly span
The smooth and changeless sea
Of Love, the token evermore
Of man's fidelity.

Don't talk behind a fellow's back!
What are his faults to you?
If he has been a faithful friend
Just show your colors true.
For in the best of us there lies
Some trace of Judas' sin
That counsels us to mean deceit,
And bids us cheat to win.

Don't talk behind a fellow's back,
Lest you should veil his eyes
Against a friend that might have led
Him into Paradise.
Remember that though truth is truth,
It does not pay to tell
A brother's faults behind his back
And turn his joys to hell!

Don't talk behind a fellow's back!
Just live a faithful friend,
And Love will bide with you alway,
Till Time and Life shall end.
For where's the man that does not prize
Among each treasured gift
The man who stoops when he is down,
And gives a friendly lift?

Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa.

Matters for the Grand President should be addressed to Mrs. Georgie M. Sargent, 2815 Fourteenth street, N. W., Washington, D. C., and that for the Grand Secretary and Treasurer to Mrs. Mary E. DuBois, 711 Story street, Boone, Iowa.

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The Old Dinner Bucket.

How dear to my heart are the scenes of my manhood,
When fond recollection presents them to view;
The railroad track gleaming, the dirt and the refuse,
The cinders that often would blow in my eyes;
Yet dearest of all to my fond recollection,
The full dinner bucket,
The shining tin bucket—
The bucket I carried to work on the ties.

How eager I seized it with hands that were grimy,
For well I knew what was resting inside;
And what though the beefsteak with pie juice was slimy,
I'd not have told Mary 'twas so, if I died.
For Mary, oftimes, when I started a-working
Would hand me the bucket, with hug and and a kiss;
So it's dear to my heart are the scenes of my manhood,
With working, and resting, and Mary by my side,
The shining tin bucket,
The full heaped-up bucket,
The bucket that Mary sealed up with a kiss.

—Mrs. Minnie L. Awl,
Galesburg, Ill., Lodge No. 103.

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Out in the Fields.

The little cares that fretted me,
I lost them yesterday,
Among the fields above the sea,
Among the winds at play,
Among the lowing of the herds,
The rustling of the trees;
Among the singing of the birds,
The humming of the bees.

The foolish fears of what might happen—
I cast them all away
Among the clover-scented grass,
Among the new-mown hay;
Among the husking of the corn
Where drowsy poppies nod,
Where ill thoughts die and good are born,
Out in the fields with God.

—Elizabeth Barrett Browning.

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Notes.

Kindly notice the change in address of the Grand Secretary and Treasurer, Mrs.

Mary E. DuBois, to No. 711 Story street, Boone, Iowa.

What better or sweeter joy is there than the joy of giving pleasure to others? So, by kind words, and deeds of kindness, let us give pleasure, and lighten the burdens of others.

Whatever is right, defend; whatever is wrong, condemn.

Let us build up the Order of the Ladies Society of the Brotherhood of Locomotive Firemen and Enginemen, and hold up the hands of those who are engaged in the work. Construction, not destruction, should be our motto.

"A little thinking shows us that the deeds of kindness we do are effective in proportion to the love we put into them. More depends upon the motive than upon the gift. If thought be selfish, if we expect compensation or are guilty of close calculation, the result will be like the attitude of mind which invited it."

If an applicant refuses or neglects to be adopted, she cannot demand the return of her membership fee. The member who solicited the application is not responsible for her having "changed her mind." An applicant should not make application for membership unless she expects to complete it.

We are building for eternity; we are a part of the great world energy, and what we do will never pass away. Love, that greatest thing in all the world, should actuate our every motive. Our association with each other means not only happiness, but it is of discipline to our natures, and engenders and develops within us a confidence that is lasting as life.

Kindly send all changes in address for the Directory to the office of Grand Secretary and Treasurer, Mrs. Mary E. DuBois, 711 Story street, Boone, Iowa, and all contributions for the Ladies Department of the Magazine to the office of the Editress, Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa.

Again, sisters, please do not send to this department, for publication, obituary notices or cards of thanks, or resolutions of respect for deceased members. They are not of general interest, and if published at all should be confined to local papers where the persons mentioned are known. Were the publication of such notices in this department required in all instances they would exclude all else. If a member of your lodge has died, tell us about it in your letters, but do not send in resolutions drafted in memory of the departed.

The Ladies Department of the Magazine will be glad to receive news from the different lodges. We are sure there is something being done, and sometimes out of the ordinary. Do not hide your light under a bushel, but let it shine, that others may catch its brightness and gather inspiration. If you have a good thing, pass it along, so that others may have the benefit of it.

Again and again it has been urged upon the officers and members of subordinate lodges the importance of a careful study of the laws governing our Order. Yet, still, many of our societies remain in ignorance of not only the laws of the Grand Lodge, but also of their own lodge, wherein many little troubles and even offenses might be evaded if the law was better understood. And I would suggest that as far as possible each member shall have a copy of the by-laws of their society and it shall be read in open meeting at least twice a year.

If the dear correspondents saw the editorial frown at clippings from local papers describing L. S. festive occasions it might alarm them so they would refrain. They are never suitable. They require lots of erasures, changes, filling in, and then are not half as good as the correspondent could do herself. When you are tempted to write with your scissors again—don't.

Dear Sister, in sending in your contributions for the Ladies Department do not forget to sign your name and give your address. We cannot publish anonymous communications. Every letter for publication must bear the signature of the writer. If so desired the name will be withheld upon request to that effect. Otherwise it cannot be published. So do not neglect the signature.

Look around you, first in your own family, then among your friends and neighbors, and see whether there be not some one whose little burdens you can lighten, whose little cares you may lessen, whose little pleasures you can promote, whose little wants and wishes you can gratify. Giving up cheerfully our own occupations to attend to others is one of the little kindnesses and self-denials. Doing little things that nobody likes to do, but which must be done by some one, is another. It may seem to many that if they avoid little unkindnesses they must necessarily be doing all that is right to their family and friends. But it is not enough to abstain from sharp words, sneering tones, petty contradictions, or daily little selfish cares; we must be active and earnest in kindness, not merely passive and inoffensive. —Little Things.

* * *

Instructors Appointed.

Mrs. Jennie Eavers, R. F. D. No. 16, Box 77, Independence, Missouri.

Mrs. C. D. Pittman, Jacksonville, Tex.

Mrs. Stena Ward, Sparks, Nevada.

Mrs. Ada Ragless, 520 Main street, Elkhart, Indiana.

Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa.

Mrs. Emma Smart, 918 S. Second street, Laramie, Wyoming.

Mrs. Elizabeth Truax, 2 Manning Boulevard, N. Albany, N. Y.

Mrs. Roseltha McGregor, 26 Cordis street, Charlestown, Mass.

Mrs. Edna Mae Adams, North Eighth street, Breckenridge, Minnesota.

Mrs. Gertrude Henry, Minturn, Colorado.

* * *

The Truly Great.

There are hearts that never falter
  In the battle for the right;
There are ranks that never alter,
  Watching through the darkest night,
And the agony of sharing
  In the fiercest of the strife,
Only gives a nobler daring,
  Only makes a grander life.

There are those whose loving mission
  Is to bind a bleeding heart,
And to teach us calm submission
  'Neath the pain of sorrow's smart;
There are angels to us bearing
  Love's rich ministry of peace,
When the night of death is nearing
  And life's bitter trials cease.

Where are those who beat down slander,
  Envy, hatred and all wrong,
Who would rather die than pander
  To the passions of the strong;
And no earthly power can crush them,
  They are conquerors of fate;
Neither fear nor favor hush them—
  These alone are truly great.

—Mrs. J. D. **BUTLER**, Past Pres. of No. 115, Clebourne, Texas.

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Those Who Lead.

Below is given the membership of the ten largest lodges of the Ladies Society of the B. of L. F. and E., as reported May 1, 1909:

1.	No. 3, Hazel, Peoria, Ill.	121
2.	No. 142, Empire, Buffalo, N. Y.	113
3.	No. 60, Pride, Harrisburg, Pa.	98
4.	No. 70, Holly, Buffalo, N. Y.	89
5.	No. 151, Missouri, St. Louis, Mo.	87
6.	No. 113, Ft. Orange, Albany, N. Y.	83
7.	No. 125, Charity, Jackson, Mich.	83
8.	No. 51, Grayson, Denison, Tex.	80
9.	No. 15, Forest Flower, Cleveland, Ohio	73
10.	No. 91, Mountain City, Altoona, Pa.	71

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New Lodges.

Copper Queen Lodge 264, organized April 13, 1909, at Houghton, Michigan, with eleven charter members. Organizer, Sister Ada Ragless, of Elkhart, Indiana.

Triumph Lodge No. 262, organized April 15, 1909, at Proctor, Minnesota, with seventeen charter members. Organizer, Sister Emma Riddell, of Duluth, Minnesota.

Charter applications have been requested and sent to the following places:

Kankakee, Illinois.
Hornell, New York.
Tyrone, Pa.
Centralia, Illinois.
Tucumcari, New Mexico.

* * *

Another New Sister.

Cheyenne, Wyoming, is boasting a Ladies Society to the Brotherhood of Locomotive Firemen and Enginemen.

It is known as Granite Lodge No. 261 and had a charter membership of nine members, with Mrs. Rich as president.

They were organized February 18th, by Mrs. Emma Smart, the president of Jewel Lodge No. 86, of Laramie, Wyoming, and Grand Instructor. Sister Mary Collican, the secretary of No. 86, came over with Sister Smart and lent some very valuable assistance in organizing.

The new lodge is doing fine work. They initiated a new member at their last regular meeting and read a new application to be voted on at their next meeting.

The B. of L. F. and E. here, gave a ball on the twenty-first of April and the new lodge served the supper and took in $53.00, and as nearly everything was donated, they will clear about $35.00 for their treasury.

They also give social afternoons at the different members' homes twice a month, on the alternate Wednesday afternoon from lodge day. Refreshments are served and the small sum of a dime is collected. The sisters are well pleased with the progress they are making and I too, am very proud of them and glad to note the great interest taken in all that they undertake, for with such enthusiasm they can't do otherwise but succeed. Some of the old lodges had better look out for Granite Lodge, for, like their name, "granite," they shall remain sure and steadfast and grow until some future time will see them numbered among our "Big Ten."

MRS. ALICE MCLAUGHLIN,
Cheyenne, Wyoming.

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A Pleasant Affair.

Late in the evening of the 28th of April members of Charity Lodge 125, and Gilbert Lodge 240, were seen wending their several ways homeward, after an afternoon and evening of social enjoyment which far surpassed any ever held in the past.

A committee of twenty from the Ladies Society entertained lavishly the members of both orders. The programme in brief was as follows:

Regular lodge meeting, 2:30 p. m.

Joint lodge meeting, 4:30 p. m.

Elaborate banquet from 6 to 7:30, and from 8:30 on we witnessed for two hours as pleasing a performance in amateur minstrelsy as has ever been our good fortune to enjoy. True to "color," many of the parts were irresistibly funny. Gay repartee flashed from "end-men(?)" to "middle-men(?)" and vice versa.

Local hits were fired—as from a Gatling gun—and landed squarely on the spot; jokes were cracked, songs were sung; lullaby's crooned; even the old-time cake walk and skirt dance had full swing; and when I say that the curtain was lowered to the accompaniment of a medley of snores, I do not mean that the audience had fallen asleep, but the performers had cracked their last joke, danced their last dance, "walked their last cake," and sung their last lullaby, which was supposed to put them all to sleep as the curtain was dropped. But the tardy stage manager failed in his duty at the critical moment and the middle man was obliged to walk in his(?) sleep and lower the curtain while the audience applauded with good-natured vim.

The evening's pleasure closed with dancing, and I venture to say that no member of the Ladies Society or Brotherhood ever enjoyed more thoroughly any entertainment given by the ladies.

Our winter has passed so pleasantly in a social way that it is with reluctance we lay aside our pleasures for the time being to take up the attending duties of early spring, but it will not be for long, as, no doubt, while the printer's ink is still damp on my letter we will already be planning our pleasant trolley rides to our pretty lakes, with well-filled baskets and other things essential to a successful picnic.

Our numbers are gradually increasing, as you can see by the "Big Ten," and we hope to still keep climbing.

MRS. LOUIE STODDARD, L. S. 125,
Jackson, Mich.

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California Poppy Lodge No. 231.

California Poppy Lodge is blooming out with new petals at nearly every meeting, sometimes one, sometimes three at a time, and before another year dawns we intend to belong to the "Big Ten," if you please.

We have recently adopted the excellent plan frequently used among various organizations for the increase of membership and attendance—that of choosing sides "a la spelling bee," each side being credited with points for the attendance of their members, and for each new application received. At the end of the contest (three months) the losing side entertains the winners. The first losing side entertained by presenting an amusing sketch entitled "A Day at the Woman's Know It All Club," followed by something to eat.

On December 30 we joined with the brothers of No. 260 in a Christmas tree, which held a load of gifts cleverly selected to "take off" the hobby, virtue or failing of the recipients. The result afforded much fun for the crowd. But the climax of the evening fun was reached when a surprise number, not down on the program, appeared in the doorway armed with all sorts of "music machines." Down the room amidst shouts of laughter, moved the procession, consisting of ten brothers and sisters disguised in character costumes. There was "Rastus and Dinah, Ikey and Rebecca, Hans and Gretchel, Lovey Moon and Hop Suey and Ragtime Liz and Stubby." When we had worn ourselves out with laughter at their antics, oyster cocktails and Boston baked beans, brown bread and coffee came to our rescue, and we all went home happy, pronouncing it the best joint meeting we had ever held.

Meeting in the same building and on the same night with the brothers of No. 260 has proven quite a help to both lodges, solving the problem of getting home for the ladies and serving as a drawing card for the brothers. Nearly every meeting we have something good to eat and a little social hour. As our last meeting was on St. Patrick's Day, we celebrated with a hard times party, giving prizes for the most ridiculous costumes. There was a large crowd present, who thoroughly enjoyed the fun.

But our proudest effort was our annual ball, held March 25th, with the brothers of No. 260. It should have been seen to be appreciated, for the decorations were the prettiest that ever graced any similar function in our Camelia City of Sacramento. The tasteful arrangement of potted plants, baskets of flowers, bowers of smilax, acacia and pepper boughs; windows latticed with ivy and a great, beautiful curtain of ivy back of the orchestra, behind which sparkled many lights, the sweet-voiced canaries beneath each chandelier; lanterns, signal flags, headlight and engine bell—all these harmoniously arranged, formed a brilliant setting for the happy throng of prettily dressed dancers. We may well be proud of the success of this occasion and of the efficient corps of brothers and sisters who made it so. To our sister, Genevieve Wallace, is due the credit of planning and directing the decorations.

We have set our standard high in every way, not only socially and numerically, but in harmony with the principles of true friendship and charity as well.

Sorrow has entered the homes of several of our sisters within the past few months, and it is such times that bind our hearts closer together in loving sympathy and service.

Right here may a word be said in behalf of the bereaved ones everywhere? It is the unspoken expression of sympathy that helps the most when sorrow comes. The spoken word only opens the wound afresh, while the hearty hand-grip and cheery word will help to heal it.

With kindest wishes to all our sisters everywhere.

California Poppy Lodge 231.

(MAUDE N. THEOBALD, Cor.)

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The Club President.

It has been wisely said that no woman can be really a good club woman until she has been a club president. The wise, far-seeing woman at the head of a great club has tremendous opportunities. Nothing is so desirable for a club that wishes to accomplish anything, as harmony. I know there are those who say friction is necessary to good work, and that a comfortable amount of quarreling argues for progress and interest. Do not believe it. The club is to most women a rest as well as a pleasure, and even to those who do the work the actual labor is nothing if they are not involved in petty quarrels or jealousies or criticisms.

With the club president of today self does not enter into the equation as much as formerly. She has more the qualities of generalship than she once had. She has learned not only how to marshal her forces, but to govern her own spirit. There was a time when we all believed that a club president was born, not made. We thought there was only about one woman to a club that could be president, and kept on electing her year after year. If other candidates arose, they were looked upon as presumptuous and ambitious. Few women, we supposed, could possibly achieve the art of presiding well. After a little, rotation in office began to be talked about, but among the older clubs, especially, it was frowned upon. And the first we knew we were getting into ruts. Then came an epoch when ambitious women did sometimes get into power, more or less to the detriment of the club. They usually learned something by the experience, and their club learned a great deal. Then came another epoch, when the president's chair was not considered so desirable, and today, in the majority of cases, the office has to seek the woman. There is occasionally a woman who thinks more highly of herself than she ought and (as she is destined to find out) more highly than others do; she aims for high office, but today she does not get it, simply because she wants it. I know scores of women who might be presidents if they would; who would be admirable club leaders if they cared to; but they will not assume the burden. Uneasy lies the head that wears a president's bonnet is too often the paraphrase of the old saying.

Being a club president, is not all fun. There are usually thorns in the bed of roses. But if a president can suit everybody she is devoid of backbone or she is fit for translation to a fairer world than this. First of all, she needs a level head; with that she will get through her incumbency and come through a better club woman for the experience. After that, as a member she will know just how best to stay her president's hands, just how to work on committees, just how and when to speak and to keep silent.

As for club members, it would be well if every club woman in the land had to take the pledge of Sorosis, and then were obliged to live faithfully up to it ever after:

"I give my name to Sorosis to keep sacredly.

"I give my interests to Sorosis to make it worthy of support.

"I pledge myself to sustain the members of Sorosis in all worthy efforts, and I will defend them against calumny.

"I will avoid doing anything that can injure the reputation of Sorosis.

"I will be a member of Sorosis as long as I can be useful to and receive benefit from the association."

The woman who lives faithfully up to every clause of this pledge is pretty likely to be a pretty good club woman.

One thing to be remarked in the modern club movement is the youth of its presidents. Fifteen years ago, or even less, we thought we must have elderly women at the heads of clubs.

Young women were objected to as too frivolous. It was thought that they might not realize the responsibilities they had shouldered and so would not live up to them. But today any "presidents' council" will reveal a number of young women. Out in Wyoming is a very young State federation, formed six months ago. The president of it is Mrs. Frank N. Shiek, an active young woman who is decidedly up to date in every way. The rest of the world is expecting some fine work out there in Wyoming, where they have few clubs and long distances, but plenty of bright, active, earnest young women.

—By HELEN M. WINSLOW.

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Trades That Cure Diseases.

"Oil workers are never bald. Visit our oil regions or those of Russia; examine the workmen's hair; it is soft and thick and glossy. For petroleum cures incipient baldness, and if your hair is thinning, rub some in. Never mind the smell. It will do you good."

The speaker, a druggist, went on earnestly:

"Shepherds enjoy remarkable health. The odd odor of a sheep seems to drive away disease. Sheep are especially good for whooping cough. In the sheep country, when a child takes whooping cough, it is the custom for the mother to put it to play among the sheep, and the next day it is well.

"The men and women who work among lavender, gathering it or distilling it, never have neuralgia or nervous headache. Lavender, moreover, is as good as a sea voyage for giving tone to the system. Run down persons often work for nothing in lavender plants in order to build themselves up.

"Salt miners can wear summer clothes in blizzard weather without fear of catching cold, for colds are unknown among salt workers.

"Breweries and tanneries and printing-ink factories bar out consumption. Turpentine works and rope-walks bar out rheumatism. Copper mines bar out typhoid."—Selected.

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Learn to Forget.

To forget—that is what we need. Just to forget. All the petty annoyances, all the vexing irritations, all the mean words, all the unkind acts, the deep wrongs, the bitter disappointments—just let them go, don't hang on to them.

Learn to forget. Make a study of it. Practice it. Become an expert at forgetting. Train that faculty of the mind until it is strong and virile. Then the memory will have fewer things to remember, and it will become quick and alert in remembering. It will not be cumbered with disagreeable things and all its attention will be given to the beautiful things, to the worth-while things.

No matter what business you are pursuing, no matter what literary subjects you may be studying, no matter what scientific problems you are trying to solve, take up the study of forgetting. The art of forgetting will give added luster to all your literary, business or scientific attainments, and it will add immeasurably to health of mind and body. —Selected.

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The Rock of Unrest.

The present-day woman is brilliant, progressive and conscientiously alert in her efforts toward development and growth along all lines, but she is slow in realizing the wasteful expenditure of nerve force that marks her daily way. She fancies that she is energetic when she is only restless, and busy when she is often worse than idle. We are all alike in this; we are all nervous, excitable, restless and in a hurry. We fidget. It is a humiliating confession to make, but it is true. We read books on the power of repose, and listen to lectures on how to use our forces and still we find it difficult to put our carefully acquired knowledge into practice.

If we are not going to a club or a reception, or preparing a feast at home, running a sewing machine or suffering under the hand of a dressmaker, we are twirling a watch chain or lead pencil, or beating a tattoo on the table or window. I know one woman who taps with her feet in rythmical measure sometimes as though she were counting; sometimes, again, as if she were beating time to music. She says that she does this often while mentally running over some phrase, or some verse of poetry, and is conscious of an effort to make the syllables come out even with the tap of her toes on the floor. Another keeps up a sort of five finger exercise on the desk or table as in her days of piano practice.

While listening to a reading the other afternoon, I observed a lady not far from me who carefully folded and unfolded her handkerchief, first corner to corner then in square fashion, during almost the entire half hour. She seemed to be paying attention to the reading, too. And when we fancy that we are indulging in luxurious restfulness, we swing vigorously forward and back in rocking-chairs, which habit, thank fortune, is now under a ban among the specialists in nervous diseases. Wisely, too, for to see half a dozen women swinging in as many rockers is enough to turn the brain of the spectator to say nothing of the brains of the oscillating women. This lack of repose is not confined to the uncultured class; it is almost as often found among the Vere de Veres.

It is always easy to criticise and give advice. But, my dear sister, when you are listening to music or a sermon or expounding your own ideas, or some one else's before an audience, why must you further tax yourself with the fidgety foolishness so common to us all? Why, when you are on the cars, either on pleasure or business bent, must you grasp the arm of the seat with a convulsive grip, or brace your feet against the one in front of you as if you expected forcible dislodgment at any moment? These are among the things that bring that anxious, worried look to your face, and that sense of prostration to your whole being.

You are counseled to overcome these weaknesses. If you go to market, just go to market and that only, and that's enough. Don't keep wondering if anything will happen to the baby while you are gone, and after you have reached home, don't be filled with anxiety lest the roast should not arrive in time for dinner. If you tell the conductor on the car where you wish to get off have a reasonable confidence that he will tell you when the desired place is reached, and do not feel compelled to keep watch yourself. And if you are waiting for a train, wait. Don't go out on the track to see if it is coming, and don't imagine that it will arrive or depart a minute earlier or later because you are to be a passenger.

If you find yourself counting the different colors in the dress of the woman across the car, or the buttons on her jacket, resolutely turn eye and brain away and think of something else or think of nothing at all. If mentally or otherwise you find yourself fidgeting, stop it.

It can be done. In fact, once the body has been trained to rest and relaxation, it is even possible to stop thinking, or to think of nothing at all, and thus for a moment or two rest is given to the brain. Not long ago I said to a woman, wise in many things, "What do you do when you cannot go to sleep at night as you should?"

"I lie awake," she replied promptly. "I lie awake resignedly, saying to myself, 'I am entirely comfortable; my room is quiet, my bed excellent; I am free from pain and if I am to lie awake when really I should be asleep, it shall be done philosophically,' and the result is, I am asleep before I know it." Which shows that she was a wise woman.

Relaxation is truly the best of all methods of inducing sleep. One may count sleep or count anything else, say the alphabet backward, roll the eyes, pick imaginary fruit or flowers, play an imaginary piano, but all this is a demand upon brain power and the brain needs to be relaxed rather than roused to greater activity and interest. Non-resistance to insomnia will often banish it more quickly and effectually than aught else. Happily the habit of repose can be cultivated; it can grow upon one. It is not a foe to energy or enthusiasm; it simply holds these qualities in check when they would spend themselves in a thousand foolish outlets. It is a gracious power that tends to that equipoise which is strength as well as beauty. Cultivate this gracious power, my sisters, lest some day you be counted among those whose epitaph should read: "Gone to wreck on the rock of unrest!"—By "A Reader" in Word and Work.

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Letters from Friends.

FROM L. S. 16.—(*Correspondent, Boone, Iowa.*) The trite saying that nothing great is ever accomplished without enthusiasm seems to be the motto of our faithful officers of No. 16. Our capable little president, Mrs. Lulu Fisher, is our main stay both in carrying on the ritualistic work and carrying out schemes in behalf of the treasury. She is an inspiration to us and keeps ever before us the object and meaning of the Ladies Society. Our officers are all untiring in their zeal, enthusiastic in their work and set before us all high ideals of loyalty to our Society, and as the correspondent is not an officer. she feels she "can speak out" and compliment the officers on their superior work at all times. We are for the most part, a lodge of busy home keepers, though not too busy to spare one afternoon every two weeks for our Order. Our meetings have been enjoyable, for love and harmony prevail. Being, as we are, very busy work-a-day women, these alternate Thursday afternoons are pleasant relaxations, when

> "The cares that infest the day
> Fold their tents like the Arabs,
> And as silently steal away."

Though seemingly living unto ourselves alone, we should not be classed as selfish and narrow by any means. Each sister, I am sure, as her strength permits, is helpful to others in some good way. Our afternoon Kensington's are very enjoyable, and while nimble fingers work, all topics known mostly in woman's realm are exhausted. Refreshments are always served and a silver offering collected. During the winter we gave a six-thirty dinner and had for our invited guests the brothers of No. 25, with their wives and families. The after-dinner hours were spent in music, readings, conversation and dancing. For the "good of the Order" we entered into a campaign for new members. Two captains were chosen, they choosing sides until the entire membership were on one side or the other. A new member counted five points and attendance counted one point, and at the end of six months the winning side was banqueted by the losing side. This was a friendly contest, which, aside from gaining materially in membership, increased the attendance at meetings.

We are now aiming to perfect the new official drill, and endeavor to close each meeting so that we can practice it after meeting. We think the drill an especially good one, as it includes the letters that stand for our organization as well as other pretty evolutions. The "old Dutch bird that is reported to be a distributer of small members of the genus homo" has left us just two baby boys, one at the home of Sister Roy Martin, the other with our sister warden, Mrs. Fred Schroeder. But for the law against covetousness we should all envy these sisters.

We sometimes fear that we have such good times among ourselves that we become too absorbed in each other and so forget the benevolent aspect of the Order until it is called to our attention by some sister who comes face to face with some crying need, and so last year when the new Y. M. C. A. building was being fitted up for the use of the association it gave us much pleasure to furnish one room. We have again this month been given an opportunity to help this same organization and have pledged them twenty-five dollars.

We have been called to mourn with our brother and sister, Mr. and Mrs. Ben Owens, in the death of their little son Harold, whose death after a short illness from scarlet fever was a shock to the entire community. It was particularly sad, as the family was under quarantine and we could not go in to them in the supreme hour of their trial. Only those who have gone through similar bereavement can know what it means. We truly sympathize with the dear ones in their affliction.

We have no death to record among our members, although some have lost dearly loved ones and others have passed through illness of more or less danger. All of these have been comforted by the sympathy and love of our sisters and cheered by flowers sent them in the name of the lodge.

We are looking forward to a box supper and dance Friday evening, April 30, at Red Men's Hall at eight o'clock, given by the members of No. 16, which we know will be a success, as all their social functions are.

We feel that we can say it is a pleasure to be a member of the Ladies Society. We endeavor to bring sunshine and happiness among the sisterhood, so the time has passed, and we feel that many blessings have been our portion and that all have been better prepared to withstand by being a member of the L. S., and in what vocation of life we follow it has its influence for a brighter, happier, more useful womanhood.

Here is hoping there are many lodges as delightful as Headlight No. 16.

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FROM L. S. 240—(*Ida Rison, Gainesville, Tex.*) Only once has our name appeared in the columns of the Magazine since our organization, and no doubt the sisters of other lodges are thinking we have become dormant and are doing nothing towards the good of the Order. But not so, and had you stepped into our lodge room the 23d of February, when we celebrated our first anniversary, you would think us indeed wide awake. Quite a large number gathered at the usual hour and were treated to a fine program consisting of vocal and piano solos and recitations. Brother and Sister Rodgers, of Cleburne, were with us, and Brother Rodgers gave us a fine talk on the benefits of the Ladies Society. Many friends outside of the railroad circle attended our celebration. After the program an invitation to the dining-room was received and a fine banquet spread, after which dancing was indulged in until a late hour.

We are wonderfully proud of our little lodge, even if it is but one year old.

We are slowly but surely increasing our membership. It was only last week that that good bird, the stork, hovered over Sister Syke's home and left a dear baby girl, which will add one more to our fraternity some time we trust.

We have one disadvantage—some members do not take as active an interest in our meetings as we should like to have them do, and occasional whispers of malice reach our ears. But we are yet in our infancy, and some day we will outgrow all such childish things. We must remember that "there is so much bad in the best of us and so much good in the worst of us that it hardly behooves any of us to talk about the rest of us." Let us all live more for one another, for in proportion as we interest ourselves in promoting the good and happiness of others our natures become elevated and enlarged and our capacities for enjoyment are developed and increased. "The luxury of doing good surpasses every other personal enjoyment." Sympathy, kindness, gentle judgment, an encouraging smile and a friendly pressure of weary hands are the little things in life which make up the sum of human happiness. Our prospects for greater achievements are bright; we are ever ready to do our part.

If any sisters or brothers chance to visit in Gainesville they will find No. 240 kind and hospitable, who extend a welcome to all who come.

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FROM L. S. 103—(*Mrs. Minnie L. Awl, Galesburg, Ill.*) Some time has passed since Co-Ed Lodge 103 has been represented in the Ladies Department, and as we are about to celebrate our second anniversary I deem it a great pleasure to report the success of our lodge.

During these two years we have prospered in every way. We are gradually increasing our membership, which at present numbers 68 members, and will in the very near future enter our names in the columns of the "Big Ten," as we have three candidates awaiting admission and more to follow.

We have had several joint meetings during the winter, which have been very enjoyable. It is rather hard to secure a good attendance, as a great many of our brothers are very busy on the road.

The annual ball given on February 22d was a most enjoyable affair and a pronounced success socially and financially. A stormy, disagreeable night no doubt kept many away who would otherwise have attended, but had more been present dancing would have been impossible, for the hall was completely overtaxed.

April 15th we are to celebrate our second anniversary by having a banquet and inviting our brothers and their wives. We are assured of a good time, for we always have that when we get together for a social time.

The winter of 1908 and '09 was marked by a very sickly period in Galesburg, and many of our members suffered in common with others. Sister Downard was compelled to undergo a very serious operation but is recovering nicely. Brother Swank has been very sick, as has Brother Huber, the president of No. 477, but both are recovering. We have had many sick but all are convalescing.

Our charter has been draped in mourning time after time, as three of our dear sisters have left us and gone to a better home beyond. Sister McDonough passed away last fall. She was laid to rest in the Quincy cemetery at Quincy, Ill. A large number of our sisters attended her funeral in a body.

Later in the winter Sister Hill, who had been poorly for a long time, closed her eyes upon this world to open them in a brighter clime. She was buried in Clinton, Iowa. A number of our sisters were present and our ritualistic burial service given at her grave. Sister Anderson, a member of our Order just a short time, died of heart failure February 1, 1909. Her death was unexpected and a great shock to us all, as the short time she had been with us we had learned to love her dearly. It is needless to say that we miss these sisters greatly.

"White hands beckoned across the river,
Sweet lips uttered 'come on,'
Eyes looked a welcome that never shone
In the gaze of a mortal lover.
Lingering, listening, passing away,
She could only smile and say
God hath called me home."

Our meetings are held the first and third Thursdays of each month and are very interesting ones. Our penny fund is never forgotten. With our sorrow, hopes and joys we should never forget our Society—always bring the best in every way we can to further its interests. Wishing continued success to every lodge in the L. S. and to the B. of L. F. and E., in whose interest we are organized, and with the best of wishes for our dear Editress I am yours in F. and C.

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FROM L. S. 254—(*Catherine Rutherford, Salida, Colo.*) The sisters of Mt. Chipeta gave a very successful dance March 17, 1909. It was a success both financially and socially. The sisters and brothers worked hard to make it such a success. The hall was beautifully decorated, and one of the attractive features was that the firemen were all dressed in overalls while the ladies all dressed in blue to match the overalls. The sisters cleared $114.25, of which they are very proud. They expect to make this an annual affair, being so elated over our former success. The brothers ably assisted the sisters.

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FROM L. S. 66—(*Mrs. Anna Ryan, Hammond, Ind.*) After so long a time I shall endeavor to write you a few lines to let you know we are still in existence. We have but twelve members but can get only five to attend lodge meetings. They are all willing to assist in every way but to attend lodge meetings. Wish some of the sisters would suggest some way to get the members interested so that they will attend. We only meet twice a month, and it seems that all could arrange their other duties in some way so that they could give those two afternoons to the L. S. We are hoping and trusting that when we secure our five new members or have them duly initiated that they will add renewed enthusiasm and interest. Any suggestions from sister lodges who have had the same experiences as we will gladly be accepted by us.

A little son has come to gladden the home of our secretary and treasurer. We miss her from our meetings, and Sister Ryan is filling her place in a very creditable manner.

With best wishes for all.

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FROM L. S. 230—(*Mrs. F. N. Johnson, Duluth, Minn.*) As we never see anything in the Ladies Department from Aerial Lodge we decided it was high time to let the readers of our department know that we are all wide awake in the interests of our order.

We are steadily increasing in membership as well as in interest. We have not a very large membership but we do have interesting meetings and keep things moving. We hope to initiate some candidates soon.

How sad it is for us to say that we too have had the shadow as well as the sunshine for our Society this month, and it is our dear sister and brother W. Brightfelt who must pass under the rod by the loss of their little daughter, who only tarried with them a couple of weeks, and we sorrowfully gave her to the angels again.

Sisters, let us hear from all of you. Tell us what you are doing, for a thought that you may express will be of the greatest benefit to us. These exchange letters are a source of inspiration and help to us.

With best wishes for success in all that you undertake and with fraternal greetings.

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FROM L. S. 246—(*Mrs. Dorcas Walsh, Asheville, N. C.*) We have been having some "jolly good times" since we were organized last July. But one that "beat them all" was our first annual ball on March 24th. About two hundred and fifty young people were present. A large number outside of railroad circles were present also. The evening was spent in dancing and cards. At a late hour refreshments of ice cream and cake were served free. A great deal of praise is due our committee who had charge of the arrangements, and Sister Stroup, chairman of the committee, spent much of her time and strength in order that the ball might be a success. All are looking forward with happy anticipations for our next one.

We held our first joint meeting with the brothers of No. 455 March 14th, with Brother Reed and Sister Stroup in the chairs. We have joint meetings once a month.

We have two applications on file, but it seems as if we can't get them to a doctor's office to take the required examination, but "where there is a will there is a way," so we hope to have them full-fledged members soon.

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FROM L. S. 47—(*Blanche W. Webb, Parsons, Kan.*) I was appointed correspondent following our last election of officers and have been patiently awaiting events of interest that I might write an acceptable letter to our department. One or two have been written only to be consigned to my own waste basket. But this one I shall send to perhaps meet a similar fate in the office of our Editress.

For a while our membership seemed decreasing, but we have again started upward and at our next regular meeting will initiate two "bran" new members.

When I first became a member of No. 47, which was three and a half years ago, there was always "something doing." One year we tried birthday parties and had some very enjoyable times. But a number of our active members have dropped out or been transferred to other places or moved away until we found it hard to accomplish much, and but for the untiring and faithful work of our president we would have been a back number indeed.

On February 22d we planned a surprise on our past president, Sister Ollie Jones, who lives at Mineral, Kan., a small mining town about twenty-five miles from Parsons. We started with well filled baskets and arrived at Sister Jones's in time for dinner. She was thoroughly surprised, but always "equal to the occasion." She entertained us as only Sister Jones, with her ever ready stories and quick wit, can entertain.

At our last regular meeting, in honor of our vice-president, Sister Orpha Bush, who is soon to leave for California, we served refreshments of ice cream and cake, and all joined in wishing Brother and Sister Bush a safe and happy journey.

Sister Alban, of Coffeyville, was a visitor at our last meeting. We hope to have something of interest to write very soon, so will promise to let the sisters know about it if this letter meets with favor.

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FROM L. S. 119—(*Correspondent, Houston, Tex.*) Some time has elapsed since the readers of the Ladies Department have heard from Bon Ami Lodge 119, nevertheless we are still here and doing good work.

At our last meeting (April 7th) we initiated one candidate, and at our next meeting, which will be April 21st, we will initiate another.

Our regular monthly socials were dispensed with during the winter months but will be continued during the spring and summer season.

We will also have joint meetings with the brothers every third Monday night.

The brothers of Houston Lodge 506 entertained the sisters with an oyster supper on the night of February 22d. Nothing was left undone by the brothers to make it an enjoyable affair, and every one had a pleasant time.

With best wishes for all sister lodges.

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FROM L. S. 60—(*Carrie R. May, Harrisburg, Pa.*) Pride Lodge 60 has not taken much space in our valuable Magazine during the past year, but we are proud of the fact that other lodges are always to the front.

After a year's rest No. 60 has awakened to a sense of duty. They are now making a strenuous effort to redeem its place. It has become so dilatory that it has even forgotten the birthday socials it once gave, but consciousness has aroused them and they are now planning for an anniversary which promises to be a grand success. It is to be a progressive euchre and dance. It not only invited the brother lodges of this city but several of the out of town lodges.

Many of our sisters have been seriously ill during the past year, but so glad to report that through the mercies of God they have been spared to us and are on the safe side of recovery.

Our lodge has been holding its own but nothing to brag about, but we are taking on renewed life and are looking for better times in the future.

As this is my first attempt for the new year I want to say that the year 1908, with all its joys and sorrows, is gone forever and we have entered the new year of 1909 with a clean white page before us. What shall our record be? We trust it may be the best of our lives.

Pride Lodge 60 sends its greetings to all sister and brother lodges everywhere, wishing them one and all a truly prosperous year.

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Grand Dues Notice.

GRAND LODGE LADIES SOCIETY OF THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

OFFICE OF
GRAND SECRETARY AND TREASURER.

BOONE, IOWA, June 1, 1909.

To all Subordinate Lodges:

Sisters—Pursuant to the requirements of the laws, you are hereby notified that the amount of fifty (50) cents for Grand Dues for the six months ending December 31, 1909, will be due and payable by all members whose names appear upon the rolls of membership July 1, 1909, to the collector of the lodge on or before July 1, 1909. The collector is required to deliver the amount thus collected, together with proper statements, to the treasurer of her lodge not later than July 5, 1909, and the treasurer is required to forward the same so as to reach the office of the Grand Secretary and Treasurer not later than July 10, 1909.

Fraternally yours,
[SEAL.] MARY E. DU BOIS,
Grand Secretary and Treasurer.

Approved:
GEORGIE M. SARGENT,
Grand President.

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Death Report.

Leonora V. Buck, Lodge 3, died March 28, 1909; cause, pleuro pneumonia. Insurance, $200.

Effie Kirk, Lodge 37, died March 13, 1909; cause, acute tuberculosis. Insurance, $200.

Ellis Griffin, Lodge 106, died April 9, 1909; cause, result of burns. Insurance, $400.

Anna Patterson, Lodge 146, died March 21, 1909; cause, cancer. Insurance, $200.

Katherine Duncan, Lodge 67, died March 8, 1909; cause, pulmonary tuberculosis. Insurance, $200.

THE DAVY TIP

is used on all our Out-Seam Gloves and Gauntlets. This prevents ripping at the ends of the fingers and

Makes Brotherhood Gloves the Best Gloves in the World.

If "Brotherhood" means anything to you it means that you should wear.

BROTHERHOOD GLOVES

Made by Brotherhood Men, Made for Brotherhood Men, Union Made and the Best Made. Try them.

Manufactured by DINIUS & ROWBOTTOM

J. S. DINIUS	S. W. ROWBOTTOM
Member Lodge 237, B. of L. F. & E.	Member Lodge 237, B. of L. F. & E.

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BRADT & SHIPMAN, Sole Agents

323 Main Street **DE KALB, ILL.**

WM. B. BURFORD PRINT, IND'PLS

Talk No. 6

A PRACTICAL ILLUSTRATION OF ARTIFICIAL LIMBS

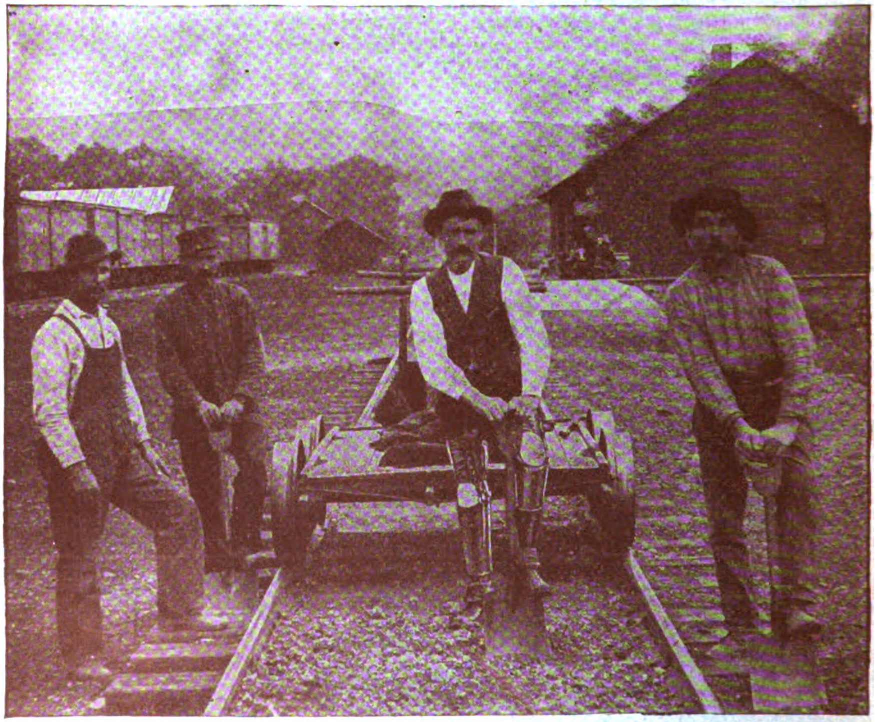
By LOWELL E. JEPSON, M. S., the President of THE WINKLEY ARTIFICIAL LIMB CO.

Continued from last issue. **MINNEAPOLIS, MINN., U. S. A.**

During these past years we have received so large a patronage from those associated with the various Railway Brotherhoods, it affords us the greatest pleasure to give in the pages of this Journal, the photographs of railroad men in actual service, now wearing our Patent Adjustable Double Slip Socket Legs, also the reproduction of letters received from them. All we ask is that fullest investigation concerning the merits, the comfort, and the satisfaction of our limbs be made directly thru those wearing them. If you have suffered amputation, or are interested in another in need of a limb, kindly write us, stating just where the amputation is made, and we will be pleased to refer you to those having similar amputations now wearing our limbs in your own locality, thru whom all desired information can be received direct and first-handed.

Butte, Montana, April 1, 1908

Both of my legs were amputated in August, 1901. A few months later I purchased a pair of the Winkley Double Slip Socket Limbs, and I have worn them ever since with perfect satisfaction. I am on my feet the most of the time. Everyone who sees me, thinks it is remarkable how I walk and do my work. I have been obliged to show some men my legs to convince them that I was wearing a pair of artificial legs.



I will cheerfully answer any correspondence and give anyone all the information I can, as the result of my own experience.

C. D. MERRITT, 1114 S. Arizona Street

Made from measurements without leaving home. *Arlington, Texas, April 17, 1908*

While in active service, I suffered the amputation of one of my legs some nine inches below the knee, and after making quite an extended investigation concerning the merits of the different styles of artificial legs, and especially thru those wearing them, I soon found out that the Winkley Double Slip Socket Leg was being worn by a great many Brotherhood men and with fullest satisfaction, so I placed my order with the Winkley Company. I have now been wearing the leg some four years with the fullest comfort and satisfaction. My work has kept me on my feet from early until late, and altho it is very hot during a part of the year at least in this Southern country, yet I have never experienced any trouble from the chafing of the stump, and after these four years of experiece, I am glad to be able to inform my Brotherhood friends, that this Double Slip Socket Leg is proving all that was claimed for it, and in my opinion is especially adapted to meet the requirements of active railway service. I can conscientiously recommend the limb and also the Winkley Company.

GEORGE GLASS, B. of R. T., No. 624, Jacksonville, Florida

Made from measurements without leaving home. *Fairbury, Nebr., April 2, 1908.*

Gentlemen:--Your letter of inquiry received and I want to say right here, that every time I look at my Double Slip Socket Leg I feel that you are my friend. I have never had five minutes' trouble with my leg and my stump is in good condition and it has never chafed in the least, even during the hottest days and here I will say that I am very thankful to you people and wish you success.

J. E. HOUGH, Sec'y and Treas. of No. 343, O. of R. C.